

Railway Age

AND RAILWAY REVIEW

FIRST HALF

1928—No. 18

MAY 5, 1928

SEVENTY-THIRD YEAR

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FEDERAL CEMENT TILE

Railway Age

Vol. 84

May 5, 1928

No. 18



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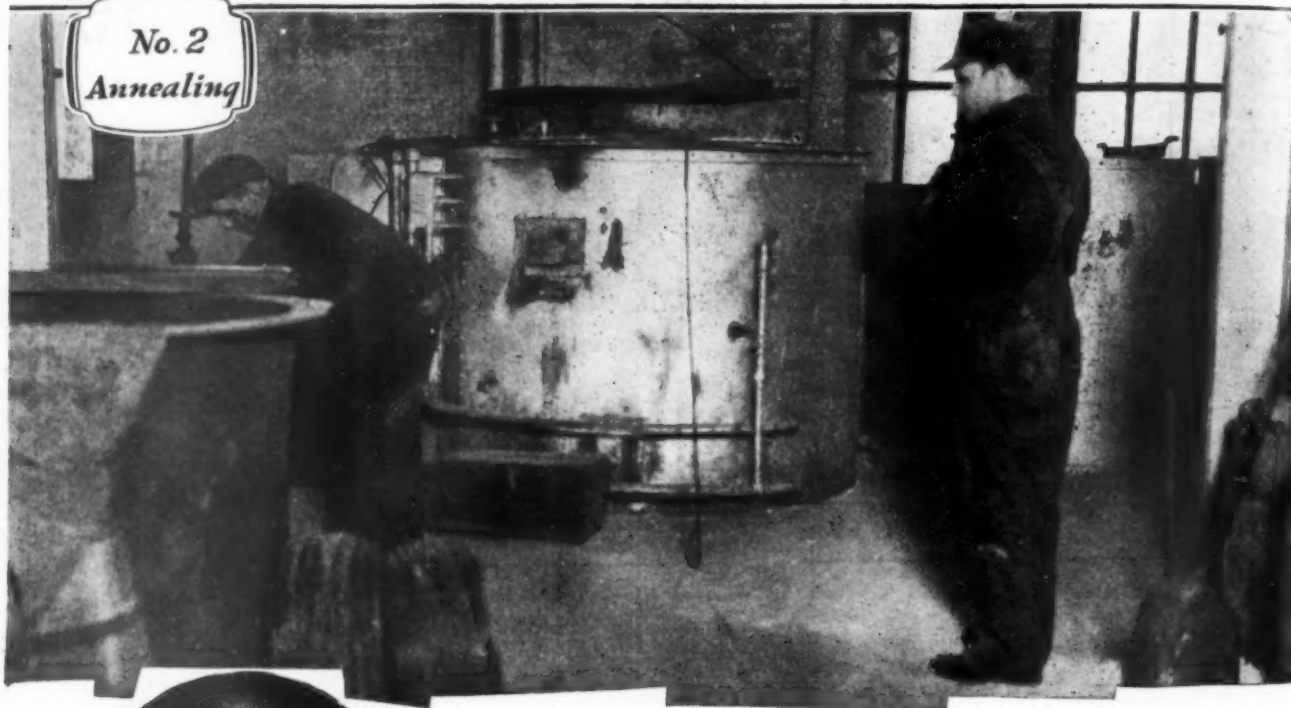
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Railway Age

Vol. 84, No. 18

May 5, 1928

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Handling Perishable Traffic

THE improvement in the handling of perishable traffic has been one of the outstanding developments in recent years. It has enabled shippers to reach markets that had hitherto been closed to them, and it has resulted in the opening up of new farming territories that otherwise would have remained sterile, owing to a lack of outlet for their products. In spite of the value of this service to the shipping public, the cost of handling this traffic is unduly high, because of practices followed by the shippers with respect to claims, diversions and reconsignments. More than 30 per cent of the refrigerator cars loaded with fruits and vegetables remain in the hands of the receivers beyond the free time, while this is true of only 10 per cent of the cars loaded with all other commodities. Such demurrage charges as are collected by the railways do not compensate them, by any means, for the time lost by such equipment. At present, a concerted campaign is being conducted to reduce this percentage, which has shown slight increases in each of the last two years, and it is believed that a better showing will be made in 1928. The most costly element in handling this business, however, is claim payments. A claim for damages is filed on practically every car that misses the market. This loss has been reduced materially in recent years by expedited handling, but it could be reduced still further if the shippers would be less eager to penalize the railways. No one expects them to stand losses without recompense, but the present practice of some shippers of filing a claim as a routine matter and hoping to get something out of it is entirely wrong. It would seem to be in the interests of the shippers and carriers alike that it be discontinued.

Equipment Orders in April

ORDERS placed for equipment in the month of April, as reported in the *Railway Age*, ran ahead of orders placed in the same month last year for locomotives, freight and passenger cars. This is the first month this year in which orders for all three classes of equipment showed increases over the same month a year ago. Orders for 33 locomotives were placed, compared with 27 in April, 1927. Freight cars ordered were 5,683 against 3,362 in the same month a year ago. Passenger car orders reached a total of 142 in April, 1928, in contrast to 6 in the same month of last year. The total

number of passenger cars ordered so far this year is running ahead of that in the same period of 1927, a period when the number of passenger cars being ordered was running better than in 1926. So far this year 884 passenger cars have been ordered as compared to 778 in 1927; for the first four months of 1926, 706 passenger cars were ordered. In both 1926 and 1927 the number of passenger cars ordered in the first one-third of the year proved to be slightly more than half of the total orders placed in the year. Prospects of further orders for equipment seem good with several inquiries out, notable among which is that of the Erie a week ago.

Eastern Merger Rumors

WHEN the railways do, or even seem to be doing something spectacular there is no lack of public interest in their activities. The latest instance of this fact occurred in the disposition of the Delaware & Hudson of its holdings of Lehigh Valley and Wabash stock to the Pennsylvania. Several days prior to the actual announcement of this transaction, articles began to appear in the daily papers predicting some such action and speculating on the probable results of it. Some observers have even gone so far as to state, unofficially of course, the details of the alinement among the so-called "four systems" and to tell the changes which would be made in routing and operation. While some may decry much of this speculative comment, it is not without its wholesome side. For one thing it betokens a very active interest in railroading whenever it becomes spectacular enough to compete with outstanding news in other fields. It is, of course, known that no plans for consolidations, even if agreed upon, can become effective without the approval of the Interstate Commerce Commission. Nevertheless so greatly does the public enjoy hearing of the accomplishments of our leaders in business and finance that rumored agreements regarding consolidation, even though necessarily tentative, receive wide publicity in newspapers whose editors know quite well what the public demands. Again, such reports, even when they prove to be largely unfounded, still have enough of substance to them to justify the opinion that railroad leaders today have the talents of their famous predecessors in finance and railroad statesmanship. The free play of such talent would undoubtedly keep the railroads even more widely in the public eye. Unfortunately, however,

such talent is not free but is closely circumscribed by regulatory authority. The railroad industry does not need to be concerned over its vitality. Its problem is to secure a chance to utilize more freely some of the ability it quite evidently possesses in the person of its outstanding leaders.

British Non-Stop Runs Attract Wide Public Interest

IN last week's *Railway Age*, page 986, a short news article told of the plan of the London & North Eastern to run its famous "Flying Scotsman" non-stop in both directions between London and Edinburgh, 392 miles. To facilitate changing engine crews enroute the company has provided the locomotives with tenders having a corridor connection between the cab and the baggage car. Service on a non-stop basis was scheduled to begin on May 1 and was widely heralded. The London, Midland & Scottish, the L.N.E.'s rival for Scottish traffic, has heretofore held the non-stop record with its competing train, the "Royal Scot", which runs non-stop between London and the Scottish border at Carlisle, 300 miles. On April 27 the London, Midland & Scottish quietly proceeded to divide its northbound "Royal Scot" into its two sections, Edinburgh and Glasgow, prior to departure from London (instead of north of the Scottish border as is customary). Then both sections were run straight through to their destinations without stops for any purpose; and Edinburgh is 400 miles and Glasgow 401.5 from London via the L.M.S. No intention of running regularly on this basis has been announced, but the L.M.S. has proved its ability to perform such service if it is demanded. The keen rivalry of the two roads has succeeded in attracting wide public attention to the British railways; so whether such long non-stop operation has any value from a standpoint of efficiency or not, it has doubtless repaid the effort as advertising. The British railways seem to be getting something like the attention from the British public that we in this country are according to the aviators.

One Important Economy of Purchased Power

AT an important locomotive repair plant on a large railway, conservative estimates show an annual saving of about \$30,000 by purchasing all electric power instead of generating it. These shops are among the largest in the country and are equipped with the most modern machine tool facilities, individually motor-driven. In all, the connected load is approximately 7,200 hp. or 5,370 kw., and the present maximum monthly demand is 720 kw. indicating a demand factor of only 13.4 per cent. The relatively low demand is attributed to the fact that the new facilities are not yet utilized to anywhere near their maximum capacity. Each month witnesses a slight increase in power demand, and the mechanical officers anticipate a uniform increase in operation which will not reach a peak for two or three years. It is logical to assume that this shop demand will increase in the next few years to the point where the ratio of maximum load to connected load will be at least 30 per cent.

On the basis of the present connected load (5,370 kw.), an ultimate demand factor of 30 per cent, 100 per cent reserve capacity and a steam-electric generating station cost of \$100 per kw., the railroad would have had to provide additional generating capacity (if it was not buying its power) to the extent of about 2,000 kw. at an estimated cost of \$200,000. Assuming annual charges for return on capital, depreciation and maintenance of 15 per cent, this additional investment would increase the road's present power generating cost about \$30,000 a year.

This added cost would be necessary to provide the reserve capacity essential for continuity of power supply, despite breakdowns of individual units, and for the future increase in power demand. If it is assumed that the railroad could have generated its electric power ultimately at the same unit cost at which it is now purchasing it, which might be possible at this point, its total power cost at present would be more nearly \$70,000 a year instead of \$40,000, owing to the need of making provision initially for the anticipated uniform increase in demand for power. In other words, the road in question would be paying about 75 per cent more for its present power, if it were burdened with the capital cost of reserve generating capacity needed to protect the present and future service requirements of this important plant. Capital has thus been conserved for other purposes by purchasing power at reasonable rates.

Pension Costs

MOST of the industrial organizations that have inaugurated pension plans, and particularly the earlier ones, failed to make sufficiently thorough surveys and actuarial studies. The assumption seems to have been that the total pension payments for a year would never reach a very high figure. Many of the organizations that established such plans a number of years ago are expressing surprise at the extent to which the pension payments have increased and are beginning to show serious concern as to the future. In commenting upon the ultimate expenditures, Edward S. Cowdrick in a paper on "Pensions: A Problem of Management," presented before the American Management Association at its winter convention last February, said: "It seems safe to assume, then, that if a company starts a retirement plan this year, the annual disbursements for pensions will increase for at least 40 or 50 years, and that they probably will increase for an indefinite period thereafter, unless a point is reached beyond which the company's payroll remains stationary, or on the down-grade for 30 years or longer."

The situation becomes all the more serious when only nominal reserves have been set up for pension purposes, or when, as in many cases, the pensions are paid from current operating revenues. Several indeterminate factors necessarily complicate the problem of calculating with any great degree of accuracy what the requirements will be many years in advance. Such things as labor turnover, wage levels, greater life expectancy and the terms upon which the pension allowances are based, must be considered. It would seem advisable, therefore, wherever possible, to institute practices in determining pension allowances which will help to minimize as many uncertainties as possible.

Most of the pension allowances made by American railroads are based on the average compensation for the last ten years of service and the number of years of service. A committee appointed in 1908 by the Board of Trade of England to inquire into the constitution, rules, administration and financial position of the superannuation and similar funds of railway companies, made a thorough study of the different plans upon which pension allowances were made on English railways and concluded, "that, in funds on an actuarial basis, the average salary system is the best one to carry out with financial soundness and without injustice the objects for which the funds were established."

One great advantage of basing the pension upon the average salary for the entire time the worker is employed is that it makes it possible at a given time to determine with a much greater degree of accuracy the future financial demands of the pension plan. It is quite probable, for instance that many men may receive proportionately large increases in their salaries during the last few years of service, so that the pension allowances, based on the average compensation for the last ten years will be greater and out of line with what they would be if based upon the average compensation for the entire time of service.

It is significant that in recent years more of those who are studying the pension problem in the industries are coming to the point of view advocated by the British commission, largely because it makes possible a much closer approximation to the ultimate pension costs. This factor should, therefore, be given critical attention by those who may be engaged in a restudy of their pension plans.

And Other Safety Devices Such as Cab Signals

ONE of the important developments in the recent hearing on train control before the Interstate Commerce Commission was the evidence presented with reference to the use of cab signals as an adjunct to train control or as a separate and distinct safety device. Continuously-controlled cab signals were developed as a by-product of train control subsequent to the issuance of the commission's first train control order in 1922, and 18 of the 44 roads mentioned in this order have installed systems including continuous cab signals. That the railways should not be of the same opinion regarding the merit of these signals, in view of their recent development, is not surprising.

Among the roads using a system without cab signals is the Baltimore & Ohio, which was represented at the hearing by C. W. Galloway, vice-president, who opposed cab signals on the ground that nothing should be done to take the engineer's mind off the road ahead. The same idea was expressed by several enginemen of the New York Central, who appeared as witnesses at the early session of this hearing, and who stated that while they had no cab signals they preferred not to have any as they feared that such signals might prevent them from keeping a proper lookout.

The contrast to this was the statement of A. F. Blaess, chief engineer of the Illinois Central, that the cab signal in use on his road has been found to be of more value than all other features of train control, and who supported his testimony with affidavits signed

by 59 enginemen who run on equipped divisions to the effect that they had found the cab signal system safer and that it facilitated the movement of trains to a greater degree than the system using wayside signals, because the cab signal is always in view and it is not necessary to watch it.

In line with this experience, the Pennsylvania has announced that it will proceed at once to install cab signals on its New York division. These signals will operate in connection with the automatic wayside signals but no automatic brake application equipment will be used. This installation is voluntary on the part of the Pennsylvania, and is in addition to the installation of train control with cab signals on 1,492 miles of track on that system in compliance with the two orders of the commission. The cab signaling for the New York division is estimated to cost \$1,350,000, which may be considered concrete evidence of the confidence of this railroad in the benefits derived.

A. H. Rudd, signal engineer of the Pennsylvania, stated as a witness at this hearing that it was the opinion of the management of the road he represented that "the cab signal, which was unknown when the original order of the commission was issued, and has been developed since as a result of the order, is one of those other 'safety devices' which the commission is authorized by law to order installed and is superior in its results to the devices originally ordered at a time when the device was unknown, accomplishing the same result as the stop and foreteller, giving additional information, and, as we think, in a better way."

Obviously the Pennsylvania hopes to secure the approval of the commission for cab signaling as satisfying its demands for safety, not only on the New York division but also elsewhere. Of course, the commission may not choose to approve or disapprove the Pennsylvania's request. Nevertheless, the status of cab signaling has been presented to the commission so directly that an expression of its attitude seems desirable.

The Way to Increase Tie Life

IN the reduction of their cross tie requirements by the preservative treatment of timber the railways have made a contribution to the conservation of our forest resources that affords a constructive example for other wood-using industries. Much emphasis has been placed, and properly so, on the marked reductions that such well maintained roads as the Santa Fe, the Lehigh Valley and the Lackawanna have effected in the number of ties required for the upkeep of their properties. Yet, one need not look very closely to see that results such as these are far from universal.

This is due in part to the delay of many roads in adopting the practice of treating ties. It is due even more, however, to a failure to realize that treatment is only one step in the progress for prolonging the life of ties, and that if it is to be effective, it must be applied to sound ties. One need only study the comparative statistics of tie renewals of roads which have followed the practice of treating their ties for practically equal periods, to discover differences as great as 60 to 75 ties per mile of track in the numbers required for renewal year after year. Such differences cannot be attributed to variations in traffic or climate for they are to be

found between roads having comparable traffic in the same territory. Neither can they be explained by differences in the character of timber for they are found between roads using the same timber. These differences result primarily from differences in the care with which ties are selected, seasoned and handled prior to, as well as, after treatment. They are due principally to the emphasis or lack of emphasis which is placed upon decay.

In spite of the attention that has been directed to the necessity for sound timber, millions of ties are being accepted for treatment today with "only a little rot," in the face of knowledge of the fact that decay in any degree is detrimental to the life of the timber and the further fact that there is no practical way to differentiate between degrees of decay if it is tolerated at all. These ties are being accepted under the mistaken idea that to reject them involves a waste of timber, whereas it is the common experience of tie buyers that when the producers learn that ties of any character will not be accepted their production ceases.

That tie producers themselves are not ignorant of the results to be expected from the acceptance of decayed timber is illustrated by a recent statement of a producer of long experience that "there will be better business for the tie men within a few years when the defective ties now going into the track come out." It requires only the most casual observation in the more active tie producing areas to ascertain that large numbers of ties are now produced and accepted for treatment which will give far less than normal life because of decay prior to treatment. In part, this decay is in the tree when cut. More commonly, however, it results from carelessness in seasoning on the right-of-way and in the woods.

If the preservation of ties is to continue to warrant the approval of the railways, and if the best results are to be secured, it is incumbent upon those railway officers responsible for their purchase and use to give them more careful attention to insure that defective ties are rejected at the source and that money is expended for treating only those which will yield an adequate return on the investment for the treatment. The lack of attention to the selection of the important material by responsible officers on not a few railways causes an unnecessary drain on the revenues of these roads.

Railroad Freight Business

THE freight business of the railways always reflects conditions in business in general, and also differences in conditions in different industries. Never were the car-loading statistics of any period more interesting as indications of business conditions than are those for the first 15 weeks of 1928.

The total number of cars loaded with freight during this period was smaller than during the corresponding part of any previous year since 1924. The most striking and important cause of the decline in traffic was the decline in shipments of coal. The total amount of bituminous coal produced in the country in 1927 was 54 million tons less than in 1926, but in the first quarter of 1927 coal shipments were extraordinarily large in anticipation of the strike in the union mines which began on April 1 of last year. The relatively small ship-

ments of coal which were a feature of railway traffic in the latter part of 1927 have continued up to the present time, and in the first 15 weeks of this year total loadings of coal were 24 per cent less than in the corresponding part of last year.

Coal is very much the most important single item of railway freight business, and this large decline in shipments of it accounts for about two-thirds of the decline in total carloadings up to the middle of April. The movement of almost all other classes of freight has been smaller, however, than in the early part of last year.

The decline in loadings of coke has been 13.6 per cent; of forest product, 4.8 per cent; of ore, 28 per cent; of miscellaneous freight 2.8 per cent, and of l.c.l. merchandise, 4 per cent.

The exceptions to the general rule have been grain and grain products and livestock. Shipments of grain and grain products have shown an increase of almost 9 per cent, and shipments of livestock an increase of 4.5 per cent.

The effects of the changes in traffic that have occurred since last year upon the earnings of the railways have been notable. In the early part of 1927 the railways on whose lines most of the coal traffic originates reported relatively the best earnings, while thus far this year they have reported relatively the poorest earnings. On the other hand, most of the railways in the west on which the bulk of the grain and livestock business originates have thus far this year been reporting increases in gross and net earnings, and this has been especially true of those serving the northwest.

It was anticipated that after April 1, when comparisons would be made with the period following the beginning of the coal mine strike last year, shipments of coal would begin to show an increase. This expectation has not yet been fulfilled, however. The decline of 54 million tons in coal production in the year 1927 was followed by a decline of 42 million tons in the first 16 weeks of the present year; and as yet there is no sign of increase. Stocks of commercial coal in storage on April 1, 1927, exceeded all previous records, aggregating 75 million tons.

Throughout the rest of last year consumption exceeded production, and on January 1, 1928, the stocks in the hands of commercial consumers had declined to 55 million tons. The average production of coal during the five years ending on December 31, 1927, exceeded 10 million tons weekly. The average weekly production thus far in 1928 has fallen 500,000 tons short of this figure, and in the first three weeks of April was less than 7,500,000 tons.

Most forecasts have indicated an increase in total railway traffic in the second quarter of the year, but it has not yet come. Obviously, however, an increase of coal shipments at least must come, sooner or later.

The present traffic situation is quite similar to that which prevailed in the early part of 1924. Usually coal shipments are smaller in the first half than in the second half of a year, but in both 1923 and 1927 they were larger in the first half than in the second half. In the first half of 1924 total carloadings were almost continuously less than in the first half of 1923, and thus far in 1928 they have been less than in 1927. It is encouraging to recall, however, that after midsummer in 1924 they began to increase and in the last one-third of the year were larger than ever before.



Looking Towards the Hump from the Classification Yard.

Yard Costs Cut 17 Per Cent

Illinois Central effects saving by efficient operation of car retarder installation

ON February 8, 1926, the Illinois Central placed in service at East St. Louis, Ill., a gravity yard equipped with electrically operated car retarders. As a result of the efficient operation of these facilities, the average cost per car handled has been reduced from 53.27 cents in 1925 to 44.18 cents in 1927, a decrease of 17 per cent. The total yard switching expense was \$475,970 in 1925 and \$415,643 in 1927, while the number of cars handled increased from 893,562 in 1925 to 943,425 in 1927. In other words, 49,863 more cars were handled in 1927 than in 1925, while the total expense decreased 12.7 per cent. During the same period, the revenue switch engine hours were reduced from 62,636 to 48,149 and the number of cars handled per revenue switch engine hour was increased from 14.3 in 1925 to 19.6 in 1927.

The saving represented by the above figures does not include the more intangible savings effected by the reduction in damage claims, the complete elimination of personal injuries, the reduction in damage to equipment and the increased speed with which cars move through the yard.

These results are particularly interesting, since they seem to disprove the more or less general opinion that a hump yard installation is only justified in places where the business handled averages 2,000 or more cars per day. The number of cars actually humped at East St. Louis yard in 1927 was 349,330 or somewhat less than 1,000 cars per day. The lay-out of the yard is also at variance with the usual design of a gravity yard handling cars in both directions. The normal lay-out in such cases, as reflected in some of the largest yards in the country, is to have two complete sets of yards, each set consisting of a receiving yard, classification yard and departure yard, for one direction. At East St. Louis, as shown in the accompanying diagram, and explained in more detail later, the business in both directions is brought into one receiving yard, taken over one hump into the same classification yard and the departure yards are dispensed with entirely.

The original yard at East St. Louis was established to take care of the interchange with connecting lines at that point and to serve as the breaking point for many

southbound manifest trains, the heavy coal traffic moving north and west and much mixed freight traffic for other roads. Most of the interchange traffic is handled through the medium of the Terminal Railroad Association of St. Louis, for which line three separate classifications are made, depending upon the trunk line to which the freight is to be delivered.

The receiving yard is 4,300 ft. long and contains 13 tracks, with a total capacity of 1,050 cars. The classification yard is about 4,900 ft. long and contains 26 tracks. Of these, 20 are used for classification purposes, having a total capacity of 1,975 cars. A double-track thoroughfare for yard and light engines is provided and the north and southbound main tracks are on the east and west sides of the yards respectively.

The car retarder installation, which was installed in this yard by the General Railway Signal Company, was described in the *Railway Age* of March 6, 1926, page 593. One two-indication and three three-indication color-light signals are used in controlling the movements of the humping and trimmer engines. The humping signals display four indications and the trimmer signals two.



Two Classification Leads Are Used

The yard is equipped with a three-section mechanical hump, which is adjustable to compensate for extremes in weather conditions. Illumination is provided by three 4,000-watt flood-lights, situated on 120-ft. towers. A 72-ft., 150-ton plate fulcrum automatic track scale has been installed near the top of the hump and about 40 per cent of the cars humped are weighed.

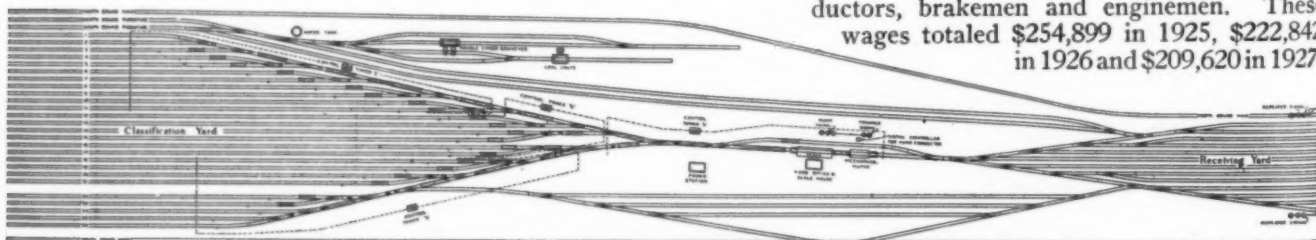
Operating Methods and Results

As stated previously, all traffic, both northbound and southbound, is handled through the same receiving and



Retarding a Car in the Main Lead Retarder

classification yards. Northbound trains are brought directly into the receiving yard and the cars are humped into the series of tracks at the west side of the classification yard, where trains are built up for movement north on northbound main track, which parallels the classification yard on the east. Cars arriving on the southbound main are brought into the receiving yard along the east side of the classification yard, and thence taken over a lead, which leaves the main line opposite the hump, into the receiving yard. They are then pushed over the hump into the series of tracks on the east side of the classification yard, built into trains and taken out to the southbound main over a lead which leaves the eastern ladder track into the classification yard.



Only One Set of Yards Is Used for Classification in Both Directions.

As each inbound freight train arrives in the receiving yard, its conductor delivers the waybills to the office at the north end of the receiving yard. After the train has been checked and inspected, switch lists are prepared for the guidance of the hump conductor and the retarder operators. If it should be necessary to make any changes or corrections in the list, the information is broadcast to all concerned by means of intercommunicating "loud-speakers."

A check of humping operations, made on January 5-6,

1928, revealed an efficient performance. The details of the work performed on these two days are given in Table 1. On January 6, 1,175 cars were humped in a

Table 1. Cars handled Over Hump

| No. Cars | January 5 Time High | Time Over | No. Cars | January 6 Time High | Time Over |
|----------|------------------------|-----------|----------|------------------------|-----------|
| 40 | 8 45 | 9 10 | 50 | 8 55 | 9 15 |
| 46 | 9 15 | 9 25 | 30 | 9 10 | 9 18 |
| 42 | 9 50 | 10 05 | 40 | 9 35 | 9 45 |
| 46 | 10 10 | 10 22 | 50 | 10 00 | 10 18 |
| 40 | 10 28 | 10 40 | 46 | 10 18 | 10 28 |
| 22 | 10 45 | 10 50 | 66 | 10 35 | 10 50 |
| 32 | 10 55 | 11 03 | 50 | 11 05 | 11 18 |
| 47 | 11 10 | 11 20 | 47 | 11 30 | 11 45 |
| 40 | 11 25 | 11 35 | 46 | 11 50 | 12 05 |
| 40 | 11 40 | 11 48 | 85 | 12 15 | 12 30 |
| 40 | 11 53 | 12 05 | 46 | 12 35 | 12 48 |
| 100 | 12 10 | 12 40 | 73 | 12 58 | 1 08 |
| 49 | 1 00 | 1 12 | 49 | 1 40 | 1 50 |
| 40 | 1 18 | 1 30 | 46 | 1 58 | 2 10 |
| 30 | 1 55 | 2 05 | 46 | 2 30 | 2 40 |
| 40 | 2 50 | 2 58 | 44 | 2 45 | 2 55 |
| 55 | 2 25 | 2 45 | 40 | 3 00 | 3 10 |
| 40 | 3 03 | 3 10 | 46 | 3 20 | 3 30 |
| 38 | 3 15 | 3 22 | 70 | 3 45 | 4 00 |
| 23 | 3 30 | 3 40 | 56 | 4 08 | 4 22 |
| 90 | 3 50 | 4 12 | 40 | 4 25 | 4 34 |
| 25 | 4 20 | 4 28 | 25 | 4 42 | 4 50 |
| 60 | 4 32 | 4 45 | 26 | 4 55 | 5 00 |
| 44 | 5 10 | 5 20 | 18 | 5 15 | 5 20 |
| 48 | 5 30 | 5 40 | 40 | 5 40 | 5 50 |

1,167 Cars

1,175 Cars

total elapsed time of 8 hr. 55 min. Deducting the usual 20-min. lunch period, this is at the rate of 2 1/3 cars per minute for the entire shift. Eliminating the intervals between cuts, it will be noted that these 1,175 cars were handled in 267 min. actual humping time, or 4.4 cars per minute. Between 12:15 and 12:30 p.m., 85 cars were humped, or 5 2/3 cars per minute and a humping speed of five or more cars per minute was attained at other intervals throughout the day. Other interesting performances during the same period included 28 cars humped in 3 min., on January 4, or 9 1/3 cars per minute; on January 7, 86 cars were humped in 10 min., or 8.6 cars per minute, and on January 8, 80 cars were humped in 12 min., or 6 2/3 cars per minute.

Table 2 gives the total yard switching expense by months for 1925, 1926 and 1927. In studying this table and also the following detailed figures, the differences in the number of cars handled should be borne in mind. The yard accommodated 12,568 more cars in 1926 than in 1925, and 37,925 more cars in 1927 than in 1926, or 49,863 more cars in 1927 than in 1925.

The principal reductions made in switching expense were, of course, in the wages of yard conductors, brakemen and enginemen. These wages totaled \$254,899 in 1925, \$222,842 in 1926 and \$209,620 in 1927.

The wages of the retarder operators, amounting to \$22,954 in 1926 and \$18,216 in 1927, should of course be added to the figures for those years before the wage reduction can be computed, but even after this is added, the wage reduction in these items amounted to \$9,103 in 1926 and \$27,063 in 1927 as compared with 1925. Yard clerks' wages amounted to \$63,769 in 1925 and \$54,330 in 1927, a decrease of \$9,439.

The total revenue switch engine hours amounted to 62,636 in 1925, 51,653 in 1926 and 48,129 in 1927. The

resulting saving in fuel consumption was \$1,035 in 1926 and \$7,230 in 1927. The steadily increasing efficiency of the yard as the men and officers become more familiar with the new operating methods is reflected in the decreasing cost per car handled. In August, 1925, for

of the hump pusher engine early in April. In 1926, a total of 5,959 hr. was worked by the hump pusher, as compared with 936 hr. in 1927. These figures are not included in the revenue switch engine hours. In other words, a reduction of 7,649 hr. was effected in switch engine hours, although 37,911 more cars were handled.

Table 2. Total Yard Switching Expenses, 1925-26-27

| | 1925 | 1926 | 1927 |
|-------------------------|-----------|-----------|-----------|
| January | \$50,551 | \$45,835 | \$39,347 |
| February | 41,511 | 38,466 | 36,382 |
| March | 39,007 | 39,928 | 39,338 |
| April | 35,437 | 35,519 | 32,246 |
| May | 35,929 | 33,679 | 30,958 |
| June | 34,715 | 34,410 | 29,813 |
| July | 35,177 | 35,083 | 35,407 |
| August | 38,015 | 36,040 | 32,669 |
| September | 38,548 | 36,432 | 34,190 |
| October | 40,853 | 39,162 | 35,265 |
| November | 42,144 | 39,654 | 34,397 |
| December | 45,276 | 41,076 | 35,631 |
| Total | \$475,970 | \$455,283 | \$415,643 |
| Average per Month | 39,764 | 37,940 | 34,637 |

example, this cost was 54.16 cents, in August, 1926, 46.54 cents and August, 1927, 37.21 cents, a reduction of 16.95 cents per car or 31.3 per cent in August, 1927, compared with the same month in 1925. During the same months, the average number of cars handled per switch engine

M-K-T Has Model Oil House

THE Missouri-Kansas-Texas has constructed an oil house at Parsons, Kan., which is saving about \$6,000 a year or 12 per cent on the investment of approximately \$50,000. This is the aggregate saving from eliminating the previous waste of oil, from more economical handling of oil and related supplies, from reducing insurance costs and from the bulk buying allowed. The building is 30 ft. wide and 120 ft. long and is built of reinforced concrete and pressed brick, with the outside of the concrete left exposed for the architectural effect, as well as to save brick. Metal sash with pivotal ventilators and metal doors are used and on both sides the roof is extended eight feet from the building line to form a canopy over side platforms. These are built

Table 3. Comparative Details of Yard Operation

| | Cars Handled | | | Revenue Switch Engine Hours | | | Cars Handled Per Rev. Sw. Eng. Hr. | | | Cost Per Car Handled (Cents) | | |
|----------------------|--------------|--------|--------|-----------------------------|-------|-------|------------------------------------|------|------|------------------------------|-------|-------|
| | 1925 | 1926 | 1927 | 1925 | 1926 | 1927 | 1925 | 1926 | 1927 | 1925 | 1926 | 1927 |
| January | 84,411 | 77,224 | 76,608 | 6,705 | 5,455 | 4,557 | 12.6 | 14.2 | 16.8 | 59.89 | 59.35 | 51.36 |
| February | 69,309 | 68,464 | 80,042 | 5,196 | 4,382 | 4,158 | 13.3 | 15.6 | 19.3 | 59.89 | 56.18 | 45.45 |
| March | 70,907 | 74,828 | 92,848 | 5,096 | 4,559 | 4,644 | 13.9 | 16.4 | 20.0 | 55.01 | 53.36 | 42.37 |
| April | 67,657 | 72,325 | 67,413 | 4,429 | 4,030 | 3,807 | 15.3 | 17.9 | 17.7 | 52.38 | 49.11 | 47.83 |
| May | 73,894 | 71,457 | 71,345 | 4,775 | 3,866 | 3,790 | 15.5 | 18.5 | 18.8 | 48.62 | 47.13 | 43.39 |
| June | 69,677 | 70,849 | 70,424 | 4,468 | 3,949 | 3,647 | 15.6 | 17.9 | 19.3 | 49.82 | 48.56 | 42.33 |
| July | 70,816 | 72,457 | 77,432 | 4,728 | 4,020 | 3,725 | 15.0 | 18.0 | 20.8 | 49.67 | 48.42 | 45.73 |
| August | 70,193 | 77,431 | 87,799 | 5,192 | 4,063 | 3,886 | 13.5 | 19.1 | 22.6 | 54.16 | 46.54 | 37.21 |
| September | 77,062 | 78,890 | 86,065 | 5,205 | 3,988 | 3,987 | 14.8 | 19.8 | 21.6 | 50.02 | 46.18 | 39.72 |
| October | 81,990 | 86,645 | 88,142 | 5,742 | 4,257 | 4,068 | 14.2 | 20.3 | 21.7 | 48.37 | 45.20 | 40.01 |
| November | 76,729 | 77,814 | 75,192 | 5,510 | 4,448 | 3,824 | 13.9 | 17.5 | 19.7 | 54.93 | 50.96 | 47.33 |
| December | 78,945 | 77,746 | 70,105 | 5,580 | 4,636 | 4,036 | 14.1 | 16.8 | 17.4 | 57.35 | 52.83 | 50.01 |
| Avg. per Month | 74,464 | 75,511 | 78,619 | 5,219 | 4,304 | 4,011 | 14.3 | 17.5 | 19.6 | 53.27 | 50.24 | 44.18 |

hour increased materially, being 13.5 in August, 1925, 19.1 in 1926, and 22.6 in 1927, the latter being an increase of 9.1 cars per hour, or 60.7 per cent.

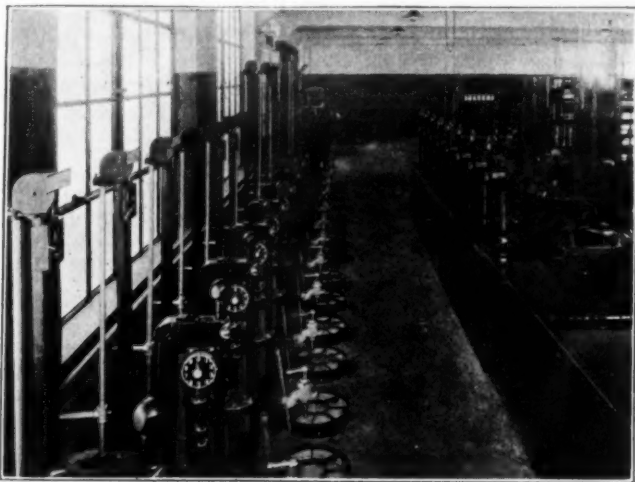
The largest saving in the total yard switching expense for any one month was in January, 1927, when the total expenses amounted to \$39,347 as compared with \$50,551 for the same month in 1925, a saving of \$11,204 during one month's operations.

Table 3 gives the details concerning the number of cars handled, the average cost per car, the number of revenue switch engine hours and the number of cars handled per switch engine hour.

As the men and officers grow more familiar with the operating details, the work and the supervision show a material improvement, which is reflected in the statistics. Since the yard was not installed in its present form until February 1, 1926, the following figures represent the last 11 months of each year only. During this period of 1926, the total yard switching expense was \$409,449 as compared with \$376,276 in 1927, or an average per month of \$37,222 and \$34,207 respectively. In addition, 37,911 more cars were handled in 1927 than in 1926, or 866,817 as compared with 828,906. The average cost per car handled shows a material decrease, being 49.49 cents in 1926 and 43.49 cents in 1927, or a reduction of 6 cents per car.

Despite the increased business, revenue switch engine hours were reduced from 46,198 in 1926 to 43,572 in 1927, the cost per revenue switch engine hour from \$8.86 to \$8.66 and the cars handled per revenue switch engine hour were increased from 17.9 to 19.9. Among the other economies effected in 1927, was the discontinuance

of concrete, car-floor high, and widened out at one end of the building into an uncovered platform 46 ft. wide and 90 ft. long. A 5,000-lb. beam scale is installed on this platform adjacent to the building, while at the extreme end in an attractive glass housing is an auto-

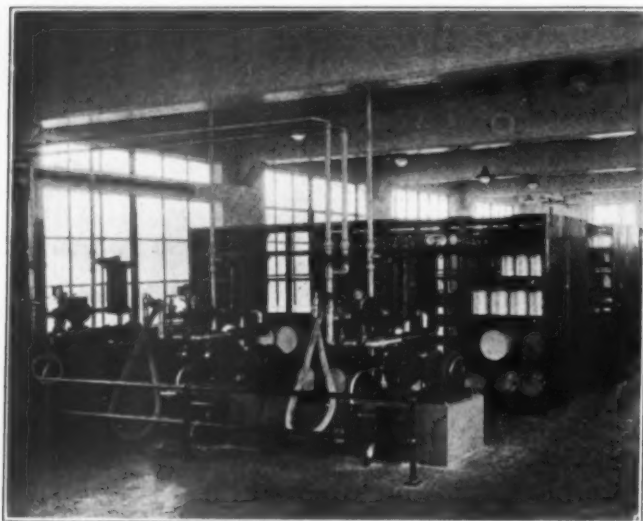


Seventeen One-gallon Self-Measuring Pumps on Left and Eight More Pumps on Right, All in Spotless Condition

matic motor-driven barrel-filling unit which is connected with two 10,000-gal. underground gasoline tanks.

The building is 9 ft. 6 in. high inside and is divided by a solid fire wall into a 30-ft. by 68-ft. supply room and

a 30-ft. by 51-ft. package and waste storage room. There are installed in the first room a battery of seventeen one-gallon capacity pumps for local service, a four-compartment journal packing vat with motor driven suction pump to transfer oil from basement tanks and between



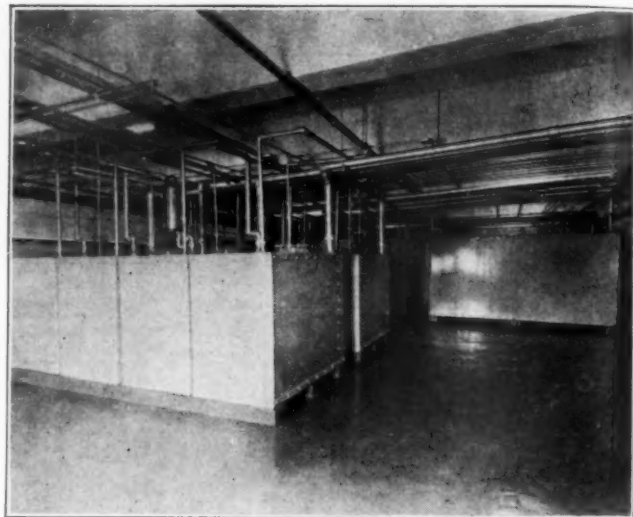
Portion of First Floor Showing Steel Shelving with Battery of Three Waste-Proof Barrel-Filling Pumps in Foreground

compartments; three larger journal packing vats and a five-gallon pump to serve them; a battery of three motor-driven, self-operating, barrel-filling pumps for supply train service; and a battery of eight 120-gal. floor units with a barrel track cradle and chain hoist. The oil storage and measuring equipment is of the Bowser type. The supply room is also equipped with a grease press and with a quantity of steel shelving for roundhouse and caboose supplies. The storage room, in addition to providing a large area for storing cotton waste, contains three structural steel barrel racks having a capacity of 150 barrels. The oil for all but the battery of 120-gal. floor units is obtained from tanks in the basement, where a storage of 90,400 gal. has been provided, comprising eight 10,000-gal., one 3,000-gal., three 1,000 gal., and eight 550-gal. rectangular tanks. In addition to the foregoing, the equipment includes lockers, a toilet, a shower bath, a sanitary water cooler and steel desks. Vapor-proof lights are installed with switches throughout the building, plugs for extension cords are provided along the outside platforms, and there are two floodlights on the roof for lighting the storage platform.

The general appearance of the exterior is enhanced by pointing the brick and covering the exposed concrete with a wash, while on the inside, close attention has been given to a color scheme of painting. Maroon gloss has been applied to the walls up to a height of 6½ ft., while

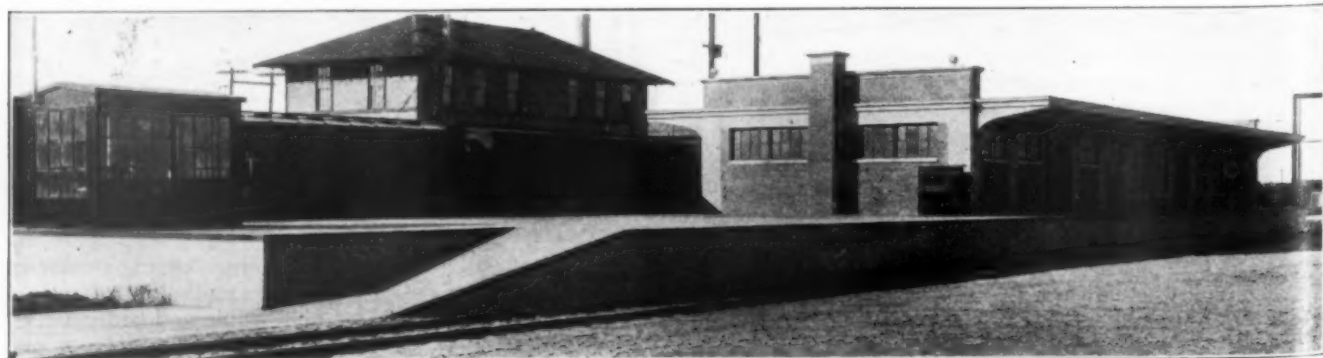
the remainder of the wall and the ceiling is painted with white gloss. The doors and sash are black and the shelving, tanks and equipment, olive green, while the floor is also painted. The basement walls and tanks are painted with a gray gloss up to the height of six feet, above which everything is white except the oil pipes which are covered with aluminum bronze, and the steam pipes which are painted black.

The new oil house is the solution of a problem which has faced the store department since the shops were rearranged there. The old facilities were antiquated and the distance from the supply room and point of use for both oil and the enginehouse and caboose supplies required by night forces was considerable. By building the new house within 60 ft. of the engine terminal and



The Oil House Basement Showing the Rectangular Tanks Serving the Pumps on the Ground Floor

including in its stock small enginehouse and caboose supplies formerly carried at the main store, it has been possible to dispense with night store clerks and to eliminate approximately \$2,000 worth of locker stocks. The speed with which the work can now be done with the modern equipment has also resulted in economies locally, while the equipment and arrangement has been an economical one in making shipments. With automatically controlled barrel-filling devices, there is no longer any waste in filling barrels with gasoline or other oils and these operations can be done more quickly and cheaply. It was necessary to roll drums of gasoline or other oil 100 yd. in handling. Added to these economies are the considerable savings now possible through the purchase of such supplies as cotton waste in much larger quantities and at correspondingly lower prices than was possible before, owing to lack of storage facilities or economical means of handling.



A View of the New Oil House Showing the Glass Housing of the Gasoline Pump at the Left



A Tie Hacking Contest Was a Feature of the Convention

Adequate Supply of Cross Ties In Sight Indefinitely

*Treatment is extending life and making available woods
otherwise unsuited for use*

WITH tie production now in excess of demand and with the requirements decreasing from year to year as the effects of timber treatment become more pronounced, the railways need have no fear of a shortage of wood cross ties for many years, according to information presented at the tenth annual convention of the National Association of Railroad Tie Producers at Hot Springs, Ark., on April 24-26. This convention, which was the first held apart from that of the American Wood-Preservers' Association, was attended by a considerable number of railway officers in addition to nearly one hundred persons engaged in the commercial production of ties.

Among the features on the program of special interest to railway men were a paper on the future cross tie demand, prepared by Earl Stimson, chief engineer maintenance, Baltimore & Ohio, and read in his absence by C. C. Cook, maintenance engineer, B. & O.; the report of a committee on Statistical Information, suggesting the preparation of authentic data regarding rates of production and shipment of ties, stocks on hand, etc.; and an address at the annual dinner by J. M. Kurn, president, St. Louis-San Francisco, on The Contact of Business. A special feature of interest was a tie hacking contest in which three employees of the Western Tie & Timber Company, each the winner of similar contests in his territory, competed in the hewing of ties from logs. All sessions of the convention were presided over by A. R. Fathman, (vice-president, Western Tie & Timber Company, St. Louis, Mo.) president, assisted by Roy M. Edmonds, executive secretary, St. Louis, Mo.

At the closing session of the convention the following officers were elected: President, Robert E. Lee, president, Hobart-Lee Tie Company, Springfield, Mo.; first

vice-president, J. J. Schlafly, president, Potosi Tie & Lumber Co., St. Louis, Mo.; second vice-president, F. M. Fonville, vice-president, George W. Signor Tie Company, Shreveport, La.; and secretary-treasurer, Roy M. Edmonds, St. Louis, Mo.

Current Production Adequate

During the convention reports were presented by directors representing the more important tie-producing districts regarding the conditions in their respective areas. In general, these reports indicated a production equal to or in excess of demand with ample labor and generally satisfaction working conditions. The production of ties was reported as having been stimulated in some areas by the dullness in the lumber market during the last year which led a number of the larger mills to turn to ties. It was evident also from the reports that the small saw mill is gradually replacing the tie hacker in many areas.

The importance of an efficient field organization was emphasized by Roscoe Hobbs, president of the Hobbs Tie & Timber Company, St. Louis, Mo., in a paper which he presented and in which he placed upon the field man the responsibility for the enforcement of specifications, stating that the average tie hacker will not bring in decayed or poorly manufactured ties if he knows they will not be accepted. "If you don't buy rotten ties," he said, "they won't bring them in." In a paper on The Problems of the Field Man, Charles O. Paulsell of the Potosi Tie & Lumber Company, Potosi, Mo., referred to the difficulty in securing ties, meeting the more exacting requirements now demanded from timber of poorer quality by men who are working alone without supervision. He suggested the preparation of a simple manual of instructions for the use of tie hack-

ers, setting forth the requirements of the specifications and describing ways of producing ties of the proper quality.

The Committee on Statistical Information, of which E. E. Pershall (vice-president, T. J. Moss Tie Company, St. Louis, Mo.) was chairman, presented a report showing graphically the fluctuations in tie production, shipments, stocks on hand and unfilled orders during the last year for a composite of a number of companies. From these curves the committee pointed to the value of such information to producers and railways alike in avoiding the violent fluctuations in prices that now occur periodically, because of alternating periods of overproduction and of acute shortage. The committee hopes to evolve some method whereby data of this character can be collected for the industry as a whole, believing that it will tend to stabilize production and prices.

In a paper on The Failure of Substitute Cross Tie Materials, Nelson Courtland Brown, professor in the New York State College of Forestry, Syracuse, N. Y., drew the conclusion that "the wooden cross tie can go to a much higher price level before the railways are warranted in giving serious consideration to substitutes. Eventually all of our ties will be cut from forests that have been renewed naturally or through some system of intensive forest management. The future of the wooden tie, properly treated, is assured."

Tie Requirements Will Decline

By EARL STIMSON

Chief Engineer Maintenance, Baltimore & Ohio

The railroads consume approximately 20 per cent of all of the lumber produced annually in the United States. Of this amount, 65 per cent, or about 2,725,000,000 ft. b. m. is cross ties. This is no inconsiderable quantity, of timber to be provided for and the question of supply to meet this demand has caused some uneasiness. Naturally the adequacy of the supply depends upon the proportion of the demands.

Cross ties are used both in the construction and in the maintenance of tracks, and the number required each year depends upon the mileage of new tracks to be built and the number of ties required for renewals. Another factor, but as yet a negligible one, affecting the demand for wooden cross ties, is the substitution of ties made of other materials.

The peak of railroad construction in this country was reached about thirty years ago. The necessity for new railroads and extensions no longer exists, although the work of internal development of the existing roads will go on as the increase in traffic demands. This means the construction of additional tracks, in multiple tracking, in reducing grades, revising alinement, building detour lines around areas of congestion, etc. Any increase that might accrue from the construction of additional lines is offset, to some extent, by tracks abandoned and taken up, as in the year ending 1926 a total of 3,140 miles of lines were reported as abandoned and taken up.

Little Prospect for Large Increase in Mileage

There seems to be little prospect of any large or steady increase in track mileage in the future, and by the same sign there is seen prospect of a diminishing demand for cross ties until the minimum annual renewal, as fixed by the life of treated ties, is reached. When this point is reached only such increase in the demand may be expected as will be due to the construction of new lines or the addition of tracks to existing facilities.

In 1926, of the total of 90,276,435 cross ties used on the Class I steam railways of the United States, according to the Interstate Commerce Commission reports, 80,745,509 ties, or 89.4 per cent, were laid in previously constructed tracks in replacements and betterments, and 9,530,926 ties, or 10.6 per cent, were laid in additional tracks and in new lines and extensions. By far the larger number of ties, therefore, are used in the maintenance of tracks already built. The number of ties required for this purpose each year, depends upon the length of life obtained from the ties in track.

This length of life depends upon the kind of wood, the physical characteristics of the track and roadbed, the density of traffic, the climatic conditions, and, last and most important, whether the tie is treated or not. A gage of the importance of treating ties is the increased life it gives the tie. This increase is from an average of 8 years untreated to an average of 20 years or more properly treated. Treated ties have been used for years in increasing numbers until in 1926 the treated ties were 69 per cent of all ties used. In 1923 the per cent of treated ties in use was 50 per cent and if the rate of increase of the past three years continues, by 1932 practically all ties used will be treated ties.

Effect of Treatment on Renewals

The effect of the treated tie on the number of ties required for renewals is clearly indicated by the number of ties used and the total miles of all tracks on which the renewals were made, for which the figures for the years 1921 to 1926, inclusive, are available: In 1921, there were used 86,521,556 ties in 379,254 miles of track, or 288 ties per mile. In 1926, there were used 80,745,509 ties in 394,945 miles of track, or 204 ties per mile.

Thus, notwithstanding the fact that there was an increase of 15,691 miles of track during this period, 5,776,047 less ties were required for renewals in 1926 than in 1921. Let us consider to what this is leading us. In 1926 there were used for renewals 80,745,509 ties, or 204 per mile of track, and in the same year there were used for the construction of additional tracks 9,530,926 ties, or about 2,600 ties per mile of track. The decrease in renewals since 1921 is 24 ties per mile of track, or at the rate of 4 ties per mile per year. The net increase in track mileage for the same period is 2,615 miles per year, and for purposes of computation we will assume a gross added mileage per year of 3,000, which will require a total of 7,800,000 ties to construct.

Assuming a 20-year life for treated ties, with all ties in track treated, the renewal will finally resolve itself into 130 ties per mile per year. Projecting by the straight line method, the present rate of decrease of renewals of 4 ties per mile per year, it will require 18½ years to reduce the 1926 renewal of 204 ties per mile per year to this figure of 130 ties per mile per year. This will be in the year 1944. When this state of renewals is reached the annual renewal requirements will be uniform and for the 1926 mileage of 394,945 will be 51,342,850 ties.

With this, however, must be considered the ties used in constructing new lines and extensions during this period which we have assumed at 7,800,000 per year and which gives a total for the 18½ years of 144,300,000 ties, of which about 40,000,000 ties would have been renewed at the end of the 18½ years.

The average renewal in this group at the end of the 18½ years would be approximately 4,000,000, which added to the 51,342,850 ties required for the 1926 mileage, gives a total of 55,342,850 ties for the 1944 re-

newal, plus the 7,800,000 for the construction of new lines and extensions, making a total of 62,142,850 ties to meet the demands in the year 1944 as compared with the demands of 1926 of 90,276,435 ties, which is a reduction of 31 per cent.

At this point we have secured the full benefit of the treated tie and we are at the average low level of cross tie requirements. Beyond this point the renewals per mile should remain stationary, but the total number of ties required for both renewals and for new tracks will increase as the track mileage increases.

D. & H. Sells Lehigh and Wabash Holdings

THE Delaware & Hudson has sold its extensive holdings of stock in the Wabash and the Lehigh Valley to the Pennsylvania. This action is taken to mean the abandonment of a plan for the formation of a new big system in the East, which would operate throughout the territory on a parity with the other four large Eastern systems—the New York Central, the Pennsylvania, the Baltimore & Ohio and the Nickel Plate group.

The Delaware & Hudson's investments in companies not affiliated with it rose \$40,000,000 during 1927 to a total of slightly more than \$45,000,000 at the close of the year. The exact number of shares it disposed of in this transaction is not officially stated, although outside calculations place it at 400,000 shares of Lehigh Valley and 200,000 of Wabash.

The statement of President Loree of the Delaware & Hudson follows:

"Stimulated by the Transportation Act of 1920, several of the larger systems in the Eastern territory promoted in 1924 a plan of railroad consolidation, which coming to the knowledge of the officers of Delaware & Hudson Co., was believed to operate adversely to its interest.

"Delaware & Hudson Co. thereupon began the purchase and accumulation of substantial holdings of the capital stocks of the Lehigh Valley and Wabash Railroads.

"Subsequent action by the federal authorities, looking to the preservation of existing channels of commerce has to some extent relieved the threat of adverse affect.

"An offer of purchase by the Pennsylvania company of these stocks, now held in the treasury free of any encumbrance, being deemed satisfactory, sale of the above securities has been made and the full consideration received in cash.

"The president and executive committee believe that the best interests of Delaware & Hudson Co. have been served thereby."

AUTOMOBILE DRIVERS approaching a railroad crossing have in many cases thought that the continued flashing of the red lights after a train had passed, was due to the electric contact made by that train, when in fact it was due to the approach of a train from the opposite direction on another track; and a tragedy resulted. This is one of the salient points in a statement issued by L. W. Berry, superintendent of the New York & Long Branch, appealing to motorists to refrain from the attempt to save a few seconds at a grade crossing when the result so often proves to be time—or life—irretrievably lost. The railroad, says Mr. Berry, has spent many thousands of dollars to make its crossings safer, but what can it do as against drivers who run into danger with their eyes wide open? No man, no machine, is infallible. Stop, look and listen!—even where signals and safeguards are provided.

Accident Investigations in Month of October

THE Interstate Commerce Commission has made public abstracts of 11 investigations of 11 train accidents which were made by the Bureau of Safety in October, 1927. Summaries of these reports are given below:

Southern Pacific, Mexia, Texas, October 2, 3:40 a.m.—Eastbound passenger train No. 18, running at 25 or 30 miles an hour was derailed at a washout and the locomotive was overturned. The fireman was killed and one other employee was injured. Excessive rain had prevailed over a large territory for several hours prior to the occurrence of the derailment and officers and track foremen were watching conditions, but the section foreman of this section had been called to another place, endangered by high water, and had become marooned by washouts. The report gives a long account of the details and tells of the various cautions which had been issued by the train dispatcher and others; finally concluding that, in view of the conditions and the train orders received, the engineman should have been running at a lower rate of speed.

Chicago, Milwaukee & St. Paul, Murdo Mackenzie, S. D., October 2.—A freight train, moving about five miles an hour, on a side track, was derailed; and the locomotive was overturned and the fireman killed. The derailment was due to the failure of a rail, which was laid in 1906, and which presumably was a second-hand rail at that time. The inspector found defects which he concludes could not have been discovered by any ordinary inspection.

New York, New Haven & Hartford, Providence, R. I., October 8, 12:42 a.m.—Eastbound freight train NU2, running past cautionary and stop signals, ran into the rear of a preceding train, consisting of two yard engines, coupled together, while moving at from eight to 20 miles an hour; and pushed these engines forward a short distance, crushing the caboose of another long freight train which had been stopped by the block signal ahead of it; and the caboose was wrecked and the conductor killed. Two other employees were injured. The blame is placed on the engineman of NU2 who evidently either misjudged the rate of speed or else delayed too long the application of the brakes.

New York, New Haven & Hartford, Hillside, Mass., October 13, 2:45 p.m.—A westbound freight train of five cars, moving about 15 or 20 miles an hour, was derailed at a washout, and the engineman was killed; one other employee injured. There were three men on the engine but none of them saw the washout until they were nearly or quite upon it, so that none of them had a chance to get off; though the curve on which the accident occurred was of but one degree and the weather was clear. The rainfall had been quite unusual, but not so great as on another occasion two months earlier; and it is concluded that possibly there may have been an unusual flow from a brook located on high ground in the woods some distance from the track. The report says, however, that the track-walker, who had been over the road during the forenoon, did not give full and proper information to the section foreman concerning the conditions that he had observed.

New York Central, Kanauga, Ohio, October 15, 7:06 a.m.—Southbound passenger train No. 32, moving at about 25 miles an hour, ran into a northbound freight, standing at the entrance of a passing track and the en-

gineman and fireman of the passenger train were killed; seven passengers were injured. This line, single track, is operated by the manual block system, the fixed signals superseding timetable superiority; and the report says that either the passenger train entered the block against a block signal or the operator failed to put the signal in the stop position. The operator is at the junction with the Hocking Valley, about 900 ft. north of this signal; and, because of a dense fog, the signal was out of his sight; and the inspector is unable to determine as between conflicting statements, what was the indication displayed by the signal. For the 900 ft. between the station and the signal, all trains are required by the rules to proceed only on a hand signal from the signalman, and the inspector believes that the passenger train passed over this section without having received such signal. The report says that the supervision of operating conditions at this point is far from being what it should be, the inspector having noticed during three days following the collision, that southbound trains were permitted to depart without having received the hand signal, "although it would naturally be expected that all concerned would be paying strict attention to the requirements of the rules, at least for a few days following the occurrence of the accident." It also appeared that both the passenger train and the freight had been instructed by word of mouth to enter the same passing track, and that had these instructions been complied with, the trains (in view of the condition of the weather) would have met on the passing track.

Atchison, Topeka & Santa Fe; Augusta, Kan., October 17, 5:53 a.m.—Eastbound freight train extra 4067 moving at about ten miles an hour, ran into the rear of a preceding freight, standing with its rear end 300 ft. within yard limits, wrecking the caboose of the standing train and killing the flagman. The engineman of No. 4067 was held responsible. He was fully familiar with the location and the requirements of Rule 93. His state of mind is perhaps indicated by the excuse quoted "that he had never before encountered a caboose so close to this yard-limit board." He had not been examined on the book of rules since he was promoted in 1919; and the report mentions that other men, examined at the investigation, had gone many years without being questioned on the rules.

Atchison, Topeka & Santa Fe, Tejon, N. M., October 18, 5:10 a.m.—Eastbound freight train, extra 3829, moving at low speed, entered a passing track which was already occupied by another train and ran into that train, demolishing the caboose, which was consumed by fire. The conductor and one brakeman of the standing train were killed. Responsibility is laid on the fireman and the head brakeman of 3829, for not maintaining a proper lookout. The train was moving over a curve of two degrees to the left so that the engineman depended upon these men for keeping proper lookout. The engineman had not specifically told either one of them to look out for a train ahead but he did tell the fireman to keep watch of an opposing train which they were to meet. Seeing that they were looking ahead, the engineman depended upon them; but their attention apparently was too exclusively concentrated on the headlight of the westbound train.

Denver & Rio Grande Western, Funston, Colo., October 19, 1:30 a.m.—Eastbound freight train extra 1171, moving at about 15 miles an hour, ran into the rear of a preceding freight, standing in the yard, and the caboose and other parts of the standing train were wrecked and consumed by fire. Much other damage was done by the fire. A drover in the standing train

was killed and five others, in the colliding train (25 cars back from the engine) were injured; also one employee injured. The engineman of extra 1171 had failed to observe and obey indications of automatic block signals and also failed to run under control in yard limits; and the fireman and a brakeman, riding on the locomotive, were also held blameworthy for not maintaining a proper lookout. They could have seen the standing freight at least 900 ft. away. Neither of these two employees had had a great deal of experience, yet, it is held that they had had enough to cause them to appreciate this feature of their responsibilities. The engineman at fault was thoroughly familiar with the territory and knew that he was likely to overtake the preceding train, but it appears that he passed the stop signal without seeing it (on account of being engaged in conversation with the brakeman); and when he caught sight of the standing caboose, 400 ft. in front of him, he lost control of himself so completely that he did not regain his composure for some seconds, during which time he, according to his own confession, could not move a hand. He finally set the brakes just before reaching the caboose, but too late to avert the collision.

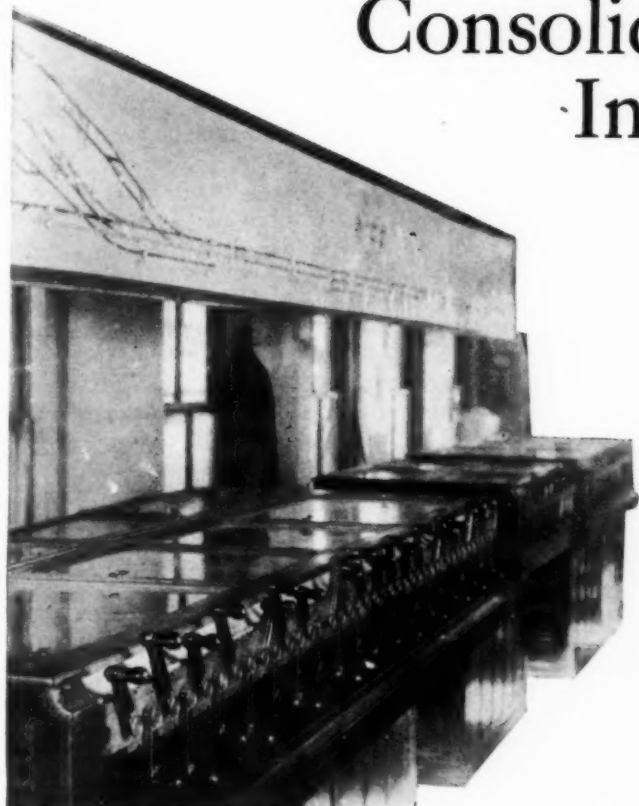
Delaware, Lackawanna & Western, Hallstead, Pa., October 19, 6:18 p.m.—Eastbound passenger train No. 28, moving at about 30 or 40 miles an hour, on track No. 2, was derailed and wrecked at a point where the track had been undermined; and the engineman and fireman were killed; 11 passengers and six employees were injured. Tracks No. 2 and No. 4 at this point were on a fill from 17 ft. to 22 ft. deep, resting on a natural surface which sloped northward, and it is believed that the sliding of the earth from beneath the tracks which caused the derailment was due to saturation of a large mass of clay beneath the natural surface of the ground. Examination after the wreck showed no indication of excessive water in the ditch, or of any choking of the culvert which drains the south side ditch a short distance east of the point of derailment.

Texas & Pacific, Waskom, Tex., October 20, 10:23 p.m.—Eastbound passenger train No. 22, moving at about 50 miles an hour, was derailed at a defective switch, making a bad wreck, including freight cars standing on the side track. The fireman and one trespasser were killed and eight passengers and one employee were injured. The switch had become loosened by the failure of the safety strap which should have held the bridge rod in position. This safety strap had been badly weakened by corrosion. Responsibility for this collision is placed on the section foreman, who had examined and oiled the switch only a few hours prior to the derailment.

Baltimore & Ohio, Hampton, W. Va., October 23, 6:20 p.m.—Westbound freight train extra 2815, moving at about eight miles an hour, collided with eastbound freight extra 2912, which had almost stopped; and the engineman and head end brakeman of 2815 were killed. The survivor on this engine, the fireman, had read and understood the meeting order, which had been disregarded, but admitted that before reaching the point of meeting, he had forgotten all about it. He said that the engineman and brakeman (killed) had also read it. The order, and also the order delivered to the eastbound train, contained running orders in addition to the meet. The fireman could offer no explanation of his forgetfulness or that of the other two men, except that there had been considerable conversation over work to be done at a point farther on. The conductor of 2815 said that he had set the brakes from the caboose, but the inspector cannot determine whether or not he correctly gives the location of the point where this was done.

Consolidation of Three Interlockings Cuts Operating Costs

Concentrating control of plants on the Galveston Causeway in one tower reduces expense \$14,000 a year



The Three Machines in One Tower

THE Gulf, Colorado & Santa Fe, which now has charge of the maintenance and operation of the Galveston Causeway, has recently completed the consolidation of the control of three large interlocking plants into one tower, by means of which it has reduced operating expenses about \$14,000 a year. The Galveston causeway carries three tracks and a highway from the main land at Virginia Point, Tex., to the Island of Galveston, a distance of 2.1 miles. One track is used exclusively by the Galveston-Houston Electric Railway, and the other two tracks are used by trains of the three owning steam roads—the Galveston, Harrisburg & San Antonio; the Gulf, Colorado & Santa Fe; and the Galveston, Houston & Henderson, as well as by the Missouri-Kansas-Texas and the International Great Northern. Each of the two steam tracks is signaled for train movements in either direction, with traffic-direction locking for each track between Virginia Point and Island. With this protection, trains are operated through this territory by signal indication without written train orders. The section included in these three plants is about 5.5 miles long.

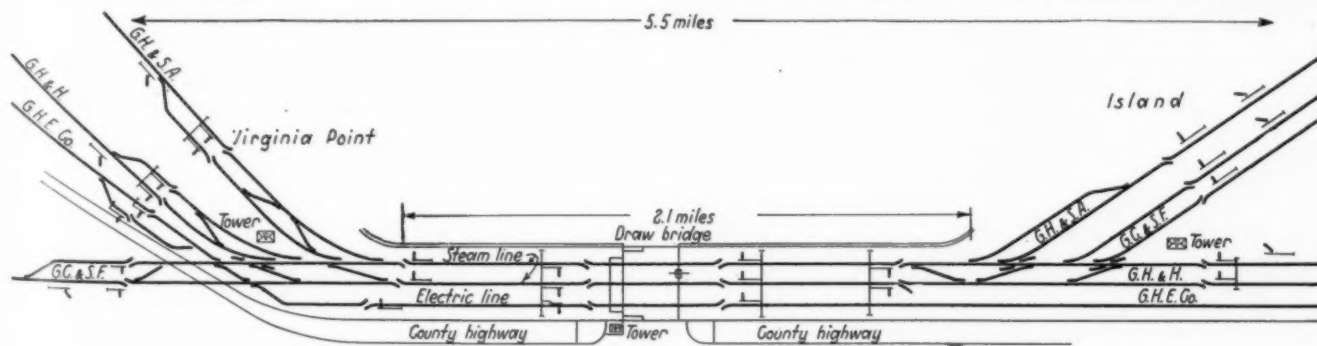
The four roads approach Virginia Point from different angles and form a junction, with numerous crossings, switches and crossovers. Likewise, the lines diverge on the island end of the causeway. When the causeway was constructed in 1912, a 41-lever interlocking plant was installed at Virginia Point to operate the switches, derails and signals at this junction; a second plant of 11 levers was installed on the drawbridge to handle the derails and signals for the protection of the draw; and a third plant with 35 levers was constructed at Island to handle the switches, derails and signals at that junction. All of the plants are of the electro-pneumatic type, manufactured by the Union Switch & Signal Company, and were installed by the signal forces of the Santa Fe.

Tendency to Increase Limits

With the development of illuminated track diagrams for interlocking plants, so that a towerman can know the exact location of a train without actually seeing it, there has been a tendency to increase the limits of interlockings, and to consolidate the control of two or more plants into one tower. However, the plants at the Galveston causeway were each rather large and the idea of consolidating the control had not been given much consideration until the Santa Fe again took charge of the operation of the causeway in January, 1927. The causeway is the joint property of the four railroads and the county. Each road has charge of the operation and maintenance of the causeway for a period of five years in turn.

A detailed study was made of several factors influencing the advisability of consolidation. On the average, approximately 50 steam and 45 electric train movements are made over this causeway each 24 hours, and in heavy traffic periods during the summer, as high as 75 steam and 60 electric trains have been handled in a single day.

However, because the train movements required line-



Track and Signal Plan of Interlockings on Galveston Causeway

ups throughout the 5.5 miles of the combined area, it was considered practicable for one leverman to handle all the levers during normal traffic with additional help, if necessary, on days of peak traffic.

The fact that the leverman would be a mile or more from the home signals on each shore was not considered a great obstacle, for a large illuminated track diagram could be provided to inform him of the location of trains with a degree of accuracy not possible by watching from the towers.

New Cables a Feature of Job

Having decided that it would be practicable to control all of the three plants from one tower, the next question was to choose the location for this tower. The tower at the drawbridge was on the side of the channel towards Virginia Point. Consolidating all controls in this tower would result in the minimum number of wires in the new submarine cable under the channel. Also, as the tower at the drawbridge was centrally located and could be enlarged to make room for the two additional machines, it was decided to concentrate the control of all the three plants here.

The control of the functions of an electro-pneumatic interlocking is all accomplished by low-voltage (10 volt) circuits over comparatively small wires. Compressed air, delivered by pipes to each function, is used to operate each switch or signal. Therefore, with the aid of an illuminated track diagram, it is practicable to locate the interlocking machine at any remote point to which a cable of small wires can be extended. Lead-covered cables were installed from the draw tower to each of the shore towers.

Making Ready for a Quick Change

The tower at the draw was enlarged to allow space for the two additional interlocking machines. An illuminated track diagram 23 ft. long was constructed and installed in the tower over the position for the machines. New relay cabinets were constructed, all of the instruments and local wiring were installed and connected through to the new cables, and wires were run to the new position for the machines. A hole was cut in the side of the tower and a heavy plank skid constructed to run down to a push car on the track. All of the work was scheduled so that the only task in moving was to take the machine from the Island tower to the draw tower and connect it to the wires in that position, and to "jumper" the wires at the former machine position to cable wires.

At 10 a.m., on November 14, the machine at Island was taken out of service, and removed intact to the new location in the draw tower. All connections were completed and the plant returned to full service at 6 p.m. on the same day. The Virginia Point machine was moved on January 19, the transfer being completed within the same hours. Since that time the three interlocking machines have been handled by one leverman on each trick.

Savings Accomplished

The additions and betterment cost of consolidating the control of these three plants in the one tower was approximately \$35,000. These changes will permit a reduction in operating expenses of approximately \$14,000 a year or a return of 40 per cent on the investment. The reduction in operating expenses includes \$982.25 a month for the wages of six operators, \$75.25 a month in maintenance forces, and \$75 a month in power consumption. These amounts, plus expenditures for stationery, fuel and other incidentals, total approximately \$14,000 a year.

Freight Car Loading

WASHINGTON, D. C.
REVENUE freight car loading during the week ended April 21 amounted to 944,694 cars, a decrease of only 5,851 as compared with loading in the corresponding week of last year and of 28,464 cars as compared with 1926. Loading of miscellaneous freight amounted to 384,469 cars, an increase of 11,060 cars as compared with the total a year ago. Loading of less-than-carload merchandise and grain and grain products also showed increases as compared with traffic in the corresponding week of last year. Coal loading amounted to 149,015 cars, a decrease of 1,102 cars as compared with last year. Loading in the Allegheny, Central Western, and Southwestern districts was larger than a year ago. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

| Districts | Week Ended Saturday, April 21, 1928 | | |
|-------------------------------|-------------------------------------|------------|------------|
| | 1928 | 1927 | 1926 |
| Eastern | 220,717 | 221,614 | 236,994 |
| Allegheny | 199,034 | 198,257 | 204,189 |
| Pocahontas | 53,079 | 59,234 | 50,649 |
| Southern | 150,558 | 154,022 | 152,089 |
| Northwestern | 113,076 | 128,809 | 120,298 |
| Central Western | 131,481 | 124,244 | 135,139 |
| Southwestern | 76,749 | 64,365 | 73,800 |
| Total Western Districts..... | 321,306 | 317,418 | 329,237 |
| Total All Roads..... | 944,694 | 950,545 | 973,158 |
| Commodities | | | |
| Grain and Grain Products..... | 39,601 | 35,539 | 38,379 |
| Live Stock | 27,445 | 28,803 | 30,368 |
| Coal | 149,015 | 150,117 | 166,594 |
| Coke | 10,247 | 11,149 | 12,285 |
| Forest Products | 65,372 | 66,079 | 77,692 |
| Ore | 9,186 | 28,375 | 14,971 |
| Merchandise L. C. L. | 259,359 | 257,074 | 263,521 |
| Miscellaneous | 384,469 | 373,409 | 369,348 |
| April 21 | 944,694 | 950,545 | 973,158 |
| April 14 | 912,377 | 949,561 | 964,794 |
| April 7 | 919,296 | 953,907 | 929,343 |
| March 31 | 948,427 | 986,462 | 928,303 |
| March 24 | 950,428 | 1,003,536 | 967,945 |
| Cumulative total, 16 weeks... | 14,565,815 | 15,395,138 | 15,037,023 |

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ending April 21 totalled 62,195 cars, an increase of 3,219 cars over the previous week and an increase of 4,217 cars over the same week last year.

| | Total Cars Loaded | Total Cars Rec'd from Connections |
|------------------------------|-------------------|-----------------------------------|
| Total for Canada | | |
| April 21, 1928..... | 62,195 | 41,209 |
| April 14, 1928..... | 58,976 | 38,280 |
| April 7, 1928..... | 56,484 | 41,796 |
| April 23, 1927..... | 57,978 | 37,607 |
| Cumulative Totals for Canada | | |
| April 21, 1928..... | 995,840 | 637,368 |
| April 23, 1927..... | 963,551 | 629,790 |
| April 24, 1926..... | 879,114 | 598,711 |

THE PREVENTION OF FOREST FIRES is the keynote of a special forest week edition of the "Southern Field," just issued by the Development service of the Southern Railway. The leading article describes a test made in the Southern's demonstration forest in South Carolina, showing damage done by fire. Other articles tell of the advantage of low chopping in naval stores operations and of the split-face method of working. The present status of forestry legislation and work in each state are set forth.

Railway Mileage of the World -- 1924-1925*

| Continent and Country | Miles of line at end of year | | Area (sq. miles) | Population (Number) | Miles of line in 1925 per | |
|---|------------------------------|---------|---------------------|------------------------|-----------------------------|----------------------|
| | 1924 | 1925 | | | 100 square miles of area | 10,000 population |
| NORTH AMERICA: | | | | | | |
| Antigua | 20 | 20 | 116 | 29,000 | 17.2 | 6.9 |
| Bahamas Islands | 10 | 28 | 4,402 | 53,000 | 0.6 | 5.3 |
| Canada | 40,093 | 40,093 | 3,729,732 | 9,364,000 | 1.1 | 42.8 |
| Costa Rica | 667 | 667 | 18,764 | 507,000 | 3.6 | 13.2 |
| Cuba | 3,723 | 3,723 | 44,209 | 3,123,000 | 8.4 | 11.9 |
| Dominican Republic | 408 | 408 | 19,344 | 895,000 | 2.1 | 4.6 |
| Guatemala | 685 | 685 | 42,355 | 2,005,000 | 1.6 | 3.4 |
| Haiti | 173 | 210 | 11,081 | 2,028,000 | 1.9 | 1.0 |
| Honduras | 812 | 812 | 59,575 | 760,000 | 1.4 | 10.7 |
| Jamaica | 200 | 205 | 4,208 | 858,000 | 4.9 | 2.4 |
| Martinique | 186 | 186 | 386 | 244,000 | 48.2 | 7.6 |
| Mexico | 16,445 | 16,443 | 757,607 | 14,281,000 | 2.2 | 11.5 |
| Newfoundland | 953 | 953 | 162,934 | 263,000 | 0.6 | 36.2 |
| Nicaragua | 200 | 200 | 49,151 | 638,000 | 0.4 | 3.1 |
| Panama | 469 | 469 | 28,764 | 446,000 | 1.6 | 10.5 |
| Porto Rico | 340 | 340 | 3,436 | 1,403,000 | 9.9 | 2.4 |
| St. Kitts | 16 | 16 | 77 | 22,000 | 20.8 | 7.3 |
| Salvador | 256 | 256 | 13,166 | 1,582,000 | 1.9 | 1.6 |
| United States (Incl. Alaska) | 250,966 | 250,900 | 3,625,099 | 106,139,000 | 6.9 | 23.6 |
| Virgin Islands | 30 | 30 | 77 | 5,000 | 39.0 | 60.0 |
| Total—North America | 316,652 | 316,644 | 8,574,483 | 144,645,000 | 3.7 | 21.9 |
| SOUTH AMERICA: | | | | | | |
| Argentina | 23,482 | 23,482 | 1,150,039 | 9,847,000 | 2.0 | 23.8 |
| Barbados | 24 | 498 | 154 | 159,000 | 323.4 | 31.3 |
| Bolivia | 1,502 | 1,502 | 613,977 | 2,990,000 | 0.2 | 5.0 |
| Brazil | 18,704 | 18,951 | 3,286,180 | 33,767,000 | 0.6 | 5.6 |
| British Guiana | 104 | 104 | 89,460 | 298,000 | 0.1 | 3.5 |
| Chile | 5,382 | 5,382 | 290,155 | 3,754,000 | 1.9 | 14.3 |
| Colombia | 1,020 | 1,108 | 495,522 | 5,855,000 | 0.2 | 1.9 |
| Dutch Guiana | 37 | 107 | 54,324 | 136,000 | 0.2 | 7.9 |
| Ecuador | 652 | 652 | 224,209 | 2,000,000 | 0.3 | 3.3 |
| Paraguay | 309 | 517 | 171,815 | 1,000,000 | 0.3 | 5.2 |
| Peru | 2,075 | 2,089 | 523,166 | 5,550,000 | 0.4 | 3.8 |
| Trinidad | 173 | 173 | 1,969 | 382,000 | 8.8 | 4.5 |
| Uruguay | 1,659 | 1,659 | 72,162 | 1,640,000 | 2.3 | 10.1 |
| Venezuela | 660 | 660 | 393,977 | 2,533,000 | 0.2 | 2.6 |
| Total—South America | 55,783 | 56,884 | 7,367,109 | 69,911,000 | 0.8 | 8.1 |
| AFRICA: | | | | | | |
| Abyssinia | 495 | 495 | 8,494 | 65,000 | 5.8 | 76.2 |
| Algiers and Tunis | 4,220 | 4,834 | 270,502 | 8,159,000 | 1.8 | 5.9 |
| Angola | 818 | 813 | 484,865 | 4,182,000 | 0.2 | 2.0 |
| Bechuanaland | 425 | 425 | 275,058 | 153,000 | 0.2 | 27.8 |
| Belgian Congo Colony | 1,273 | 1,273 | 920,889 | 7,153,000 | 0.1 | 1.8 |
| British Central Africa (Nyasaland) | 174 | 174 | 39,962 | 1,212,000 | 0.4 | 1.4 |
| British East Africa (Incl. Zanzibar) | 693 | 693 | 431,969 | 5,945,000 | 0.2 | 1.2 |
| Egypt (Incl. Sudan) | 4,894 | 4,894 | 1,361,005 | 19,949,000 | 0.4 | 2.5 |
| Equatorial Africa | 336 | 336 | 871,004 | 2,851,000 | 0.04 | 1.2 |
| French West Africa | 1,714 | 2,070 | 1,853,283 | 12,283,000 | 0.1 | 1.7 |
| Gold Coast | 302 | 302 | 78,610 | 2,108,000 | 0.4 | 1.4 |
| Kamerun | 283 | 283 | 166,525 | 3,000,000 | 0.2 | 0.9 |
| Madagascar | 600 | 600 | 242,201 | 3,382,000 | 0.2 | 1.8 |
| Mauritius | 144 | 144 | 734 | 377,000 | 19.6 | 3.8 |
| Morocco | 885 | 885 | 160,232 | 4,330,000 | 0.6 | 2.0 |
| Mozambique | 521 | 572 | 294,981 | 3,120,000 | 0.2 | 1.8 |
| Nigeria | 1,126 | 1,126 | 336,062 | 18,071,000 | 0.3 | 0.6 |
| Reunion | 79 | 79 | 927 | 173,000 | 8.5 | 4.6 |
| Rhodesia | 2,470 | 2,470 | 440,155 | 2,011,000 | 0.6 | 12.3 |
| Sierra Leone | 355 | 355 | 30,888 | 1,541,000 | 1.1 | 2.3 |
| Southwest Africa | 1,680 | 1,680 | 322,433 | 228,000 | 0.5 | 73.7 |
| Tanganyika | 1,019 | 1,022 | 365,097 | 4,124,000 | 0.3 | 2.5 |
| Togoland | 206 | 206 | 20,077 | 671,000 | 1.0 | 3.1 |
| Union of South Africa | 11,745 | 11,745 | 472,355 | 7,294,000 | 2.5 | 16.1 |
| Total—Africa | 37,457 | 37,481 | 9,448,308 | 112,382,000 | 0.4 | 3.3 |
| ASIA: | | | | | | |
| Asia Minor, Syria and Arabia (Incl. Cyprus) | 3,829 | 3,829 | 1,418,225 | 21,311,000 | 0.3 | 1.8 |
| British East Indies | 38,068 | 38,571 | 1,892,627 | 319,647,000 | 2.0 | 1.2 |
| Ceylon | 733 | 733 | 25,328 | 4,505,000 | 2.9 | 1.6 |
| China | 7,173 | 7,469 | 4,370,659 | 441,200,000 | 0.2 | 0.2 |
| Cochin China, Cambodia, Annam, Tonking | 1,490 | 1,490 | 270,579 | 19,844,000 | 0.6 | 0.8 |
| Dutch East Indies (India, Java and Sumatra) | 1,895 | 2,971 | 788,340 | 49,543,000 | 0.4 | 0.6 |
| Japan (Incl. Korea, Formosa and Kuangtung) | 13,110 | 14,032 | 262,433 | 84,567,000 | 5.3 | 1.7 |
| Malay States | 1,163 | 1,163 | 51,004 | 2,448,000 | 2.3 | 4.8 |
| North Borneo, Sarawak | 140 | 140 | 78,958 | 889,000 | 0.2 | 1.6 |
| Palestine | 696 | 696 | 8,996 | 757,000 | 7.7 | 9.2 |
| Persia | 350 | 135 | 628,186 | 10,000,000 | 0.02 | 0.1 |
| Philippines | 810 | 810 | 115,019 | 11,414,000 | 0.7 | 0.7 |
| Pondichery | 59 | 59 | 116 | 175,000 | 50.9 | 3.4 |
| Portuguese India | 54 | 57 | 1,622 | 579,000 | 3.5 | 1.0 |
| Russia (Asiatic) | 10,184 | 10,550 | 6,191,123 | 30,712,000 | 0.2 | 3.4 |
| Siam | 1,539 | 1,547 | 200,077 | 9,724,000 | 0.8 | 1.6 |
| Total—Asia | 81,293 | 84,252 | 16,303,292 | 1,007,315,000 | 0.5 | 0.8 |
| AUSTRALIA: | | | | | | |
| Canberra Federal District | 5 | 5 | 927 | 4,000 | 0.5 | 12.5 |
| Hawaii (Incl. Maui and Oahu) | 243 | 252 | 6,448 | 292,000 | 3.9 | 8.6 |
| New Caledonia | 19 | 19 | 7,220 | 48,000 | 0.3 | 4.0 |

* Adapted by the Bureau of Railway Economics from a Compilation by Archiv fur Eisenbahnwesen.

| | | | | | | |
|--------------------------|---------|---------|------------|---------------|------|-------|
| New South Wales | 5,654 | 5,654 | 309,421 | 2,272,000 | 1.8 | 24.9 |
| New Zealand | 3,084 | 3,200 | 103,900 | 1,426,000 | 3.1 | 22.4 |
| Northern Territory | 199 | 199 | 523,630 | 4,000 | 0.04 | 497.5 |
| Queensland | 7,067 | 7,067 | 670,464 | 855,000 | 1.1 | 82.7 |
| South Australia | 3,488 | 3,488 | 380,077 | 543,000 | 0.9 | 64.2 |
| Tasmania | 873 | 873 | 26,216 | 212,000 | 3.3 | 41.2 |
| Victoria | 4,483 | 4,483 | 87,876 | 1,671,000 | 5.1 | 26.8 |
| Western Australia | 4,870 | 4,870 | 975,968 | 368,000 | 0.5 | 132.3 |
| Total—Australia | 29,985 | 30,110 | 3,092,087 | 7,695,000 | 1.0 | 39.1 |
| EUROPE: | | | | | | |
| Albania | 186 | 186 | 10,618 | 804,000 | 1.8 | 2.3 |
| Austria | 4,373 | 4,373 | 32,355 | 6,535,000 | 13.5 | 6.7 |
| Belgium | 6,893 | 6,893 | 11,737 | 7,812,000 | 58.7 | 8.8 |
| Bulgaria | 1,624 | 1,639 | 39,807 | 5,483,000 | 4.1 | 3.0 |
| Czechoslovakia | 8,718 | 8,718 | 54,209 | 13,613,000 | 16.1 | 6.4 |
| Denmark | 3,096 | 3,148 | 16,602 | 3,420,000 | 19.0 | 9.2 |
| Estonia | 890 | 890 | 18,340 | 1,107,000 | 4.9 | 8.0 |
| Finland | 2,821 | 2,821 | 150,000 | 3,365,000 | 1.9 | 8.4 |
| France | 33,284 | 33,284 | 212,741 | 44,744,000 | 15.6 | 7.4 |
| Germany | 36,028 | 36,136 | 182,240 | 63,184,000 | 19.8 | 5.7 |
| Great Britain | 24,396 | 24,396 | 94,209 | 45,213,000 | 25.9 | 5.4 |
| Greece | 1,983 | 1,983 | 49,035 | 5,022,000 | 4.0 | 3.9 |
| Hungary | 5,922 | 5,922 | 35,869 | 8,275,000 | 16.5 | 7.2 |
| Italy | 12,840 | 13,110 | 119,653 | 38,756,000 | 11.0 | 3.4 |
| Jugo-Slavia | 5,699 | 6,118 | 96,023 | 11,997,000 | 6.4 | 5.1 |
| Latvia | 1,755 | 1,775 | 25,405 | 1,845,000 | 7.0 | 9.6 |
| Lithuania | 1,939 | 1,939 | 21,583 | 2,371,000 | 9.0 | 8.2 |
| Luxemburg | 334 | 342 | 1,004 | 267,000 | 34.1 | 12.8 |
| Malta, Jersey, Man | 68 | 68 | 425 | 375,000 | 16.0 | 1.8 |
| Netherlands | 2,265 | 2,265 | 13,205 | 6,865,000 | 17.2 | 3.3 |
| Norway | 2,147 | 2,230 | 125,019 | 2,732,000 | 1.8 | 8.2 |
| Poland | 11,974 | 12,054 | 149,961 | 27,177,000 | 8.0 | 4.4 |
| Portugal | 2,129 | 2,129 | 35,483 | 6,033,000 | 6.0 | 3.5 |
| Rumania | 7,322 | 7,424 | 113,591 | 17,500,000 | 6.5 | 4.2 |
| Russia (European) | 35,708 | 35,739 | 2,240,542 | 115,508,000 | 1.6 | 3.1 |
| Spain | 9,676 | 9,676 | 195,058 | 21,967,000 | 5.0 | 4.4 |
| Sweden | 9,765 | 9,765 | 173,166 | 6,006,000 | 5.6 | 16.3 |
| Switzerland | 3,572 | 3,587 | 15,946 | 3,918,000 | 22.5 | 9.2 |
| Turkey | 257 | 257 | 10,425 | 1,000,000 | 2.5 | 2.6 |
| Total—Europe | 237,664 | 238,867 | 4,244,251 | 472,894,000 | 5.6 | 5.1 |
| RECAPITULATION: | | | | | | |
| North America | 316,652 | 316,644 | 8,574,483 | 144,645,000 | 3.7 | 21.9 |
| South America | 55,783 | 56,884 | 7,367,109 | 69,911,000 | 0.8 | 8.1 |
| Africa | 36,457 | 37,481 | 9,448,308 | 112,382,000 | 0.4 | 3.3 |
| Asia | 81,293 | 84,252 | 16,303,292 | 1,007,315,000 | 0.5 | 0.8 |
| Australia | 29,985 | 30,110 | 3,092,087 | 7,695,000 | 1.0 | 39.1 |
| Europe | 237,664 | 238,867 | 4,244,251 | 472,894,000 | 5.6 | 5.1 |
| Total—World | 757,834 | 764,238 | 49,029,530 | 1,814,842,000 | 1.6 | 4.2 |

Transportation Division Meets in St. Louis

THE Transportation Division of the American Railway Association held its annual meeting at the Hotel Chase, St. Louis, Mo., on April 26. W. A. Worthington, vice-chairman, who is vice-president of the Southern Pacific, presided in the absence of the chairman, J. J. Bernet, president of the Erie. The session was confined entirely to the consideration of the committee reports, there being no formal papers on the program.

The committee on freight handling service presented an exhibit covering the correct methods of loading various commodities in closed cars. Detailed rules and figures were given, covering the proper means of securing, in closed cars, materials requiring bracing, blocking, door protection or decking. The exhibit contained several pages of diagrams illustrating the proper methods, giving detailed drawings and data concerning the methods of bracing.

The exhibit also contained a complete treatise on the proper loading and bracing of shipments in barrels. Copies of the exhibit may be obtained from G. W. Covert, secretary of the division, 431 South Dearborn street, Chicago.

During the year, this committee has been active in an effort to bring about some uniform action to reduce damage claims on shipments of furniture. When consideration is given to the fact that, in 1926, claims paid on furniture shipments amounted to \$1,900,939, or 7.5

per cent of the total damage claims paid, the importance of improvement in this regard may be realized.

The committee on demurrage, storage, reconsignment and diversion has been furthering the co-operative effort being made by shippers, receivers and the railways to reduce relays to refrigerator cars, while being held for unloading or reconsigning. Figures show that more than 30 per cent of the refrigerator cars loaded with fresh fruits and vegetables are detained beyond the free time, as compared with less than 10 per cent of the total cars loaded with other commodities.

Changes In Demurrage Rules

The remainder of this committee's report is devoted to changes in demurrage and storage rules, with the idea of maintaining uniformity in this regard. An exhibit was also presented giving explanations of the rules and charges covering the diversion and reconsignment of carload freight.

This exhibit occupies 50 pages and gives a complete picture of the rules in this regard.

The report of the committee on records covers the work done in the assignment of reporting marks for the cars of the railways and private companies. The report was accompanied by an exhibit showing these reporting marks in detail for all cars.

TWO LANDSLIDES occurred on the Palmyra tunnel of the Louisville & Nashville near Clarksville, Tenn., within 24 hours on April 21. The first cavein, near the south end of the tunnel, occurred at noon and the second during the following night.

Fostering Esprit de Corps Pays

THERE are 44 Frisco employees' clubs in cities along the lines of the St. Louis-San Francisco.

While the object of these clubs is primarily social, the movement has also resulted favorably to both the management and the employees in a greater mutual understanding, in co-operation and incidentally in securing traffic. The clubs engage in all sorts of social and civic activities taking leading parts in promoting worthy charities in their various cities.

The development of employee loyalty is highly important on any railway, but it is particularly so in the case of the Frisco for this line, in common with many roads in the Southwest, has had a rather checkered history. It was not until the present management took over the road that stable conditions of employment were reached.

The movement had its inception among the employees themselves and up to November, 1927, six clubs had been formed. These were at Kansas City,

members, including the chief clerk in the president's office, the assistant freight traffic manager, the general passenger agent and the director of publicity. The latter acts as chairman of the committee and promotes the organization of the clubs, while the other three committee members look after the activities pertaining to their respective departments.

This committee began operations at once in its work of fostering esprit de corps. It outlined to supervisory officers, so that they in turn might pass the information along to the employees interested, how these clubs should be formed and gave suggestions as to how the social and other activities might be conducted. While encouraging the practice of securing speakers from outside sources, such as local bankers, business and professional men, an auxiliary speakers' bureau was formed. This bureau is composed of Frisco officers of the various departments, who attend the club meetings and talk to the members about the work of their departments in an educational and instructive way. Whenever a speaker is desired for a club meeting,



The Presidents of the Frisco Employees' Clubs Met in Springfield, Mo., in March.

Mo., Fort Scott, Kan., Birmingham, Ala., Memphis, Tenn., Tulsa, Okla., and Oklahoma City. Each of these clubs had formed committees for the purpose of securing traffic and the motto of all of them was: "Know your fellow employee."

The results obtained were gratifying, particularly in view of the fact that each club was an entirely individual entity working independently of the others. As a result, President J. M. Kurn, in a circular issued November 8, 1927, commended these clubs, stating:

"One of the activities that has been extremely beneficial not only to the company, but to the employees themselves, has been the organization of various clubs over the system. It is my purpose heartily to encourage these organizations for social and club activities, knowing that such activities must redound to the benefit of the entire Frisco family. I am particularly desirous that our officers take a pronounced interest in meeting with employees on such occasions whenever at all possible."

Central Committee Formed

In the same circular, Mr. Kurn announced the appointment of a central committee to aid in the formation of new clubs and the continued activities of those already in existence. This committee consisted of four

the club president sends in a request to the chairman of the central committee, who arranges the matter.

Club Activities

In the 56 days between the issuance of President Kurn's circular and the first of the year, 28 new clubs were organized, making a total of 34 clubs. Since that time 10 new clubs have been formed and 75 per cent of all Frisco employees are now members of these clubs.

The Frisco Girls' Club of St. Louis is one of the most active of the organizations. It has a membership of 255 girls, which is 100 per cent of the girl employees of the general offices. This club has been particularly prominent in promoting charities, in instilling a spirit of helpfulness and co-operation among the feminine employees at the general offices and in securing traffic for the Frisco. Through its choral division it has aided materially in advertising the Frisco, since the choir of 50 girls has been much in demand for various programs and for radio broadcasting.

The Frisco Employees' Club of Fort Scott, Kan., bought a 5-column, 10-in. ad in the December 24 issue of the local paper, wishing friends and patrons of the Frisco in that city a Merry Christmas.

Except for helpful suggestions and the assistance of the speakers' bureau, the organization and ac-

tivities of these clubs has been left entirely to the employees. The president and other officers of the various clubs are elected from practically every department. The list of presidents includes three conductors, an engineman, a stationary engineer, several clerks and stenographers, an agent, a cashier, a welder, a switchman, a timekeeper, a locomotive inspector, a general foreman and a yardmaster.

More Traffic Secured

The Frisco employees, in recent years, have been active and important factors in securing traffic for that railway. However, until last November, these efforts had been entirely individual. With the formation of employee clubs on a large scale, the employee solicitation work was placed under the jurisdiction of a regularly constituted traffic committee of each club, known as the greater traffic committee. All tips on prospective freight and passenger business secured by employees are forwarded at once to the chairman of the traffic committee, who takes whatever action is necessary to

C. & N. W. Exhibits Train Control Equipment

TO acquaint the public with its automatic train control installation between Chicago and Omaha, Neb., the Chicago & North Western has prepared two exhibits, one in its passenger terminal, and another in its city ticket office at Chicago, each exhibit comprising the various units of the General Railway Signal Company's continuous automatic train control system, together with suitable explanatory posters which describe briefly the functions of each piece of equipment.

The principal exhibit is that in the terminal at Madison and Canal streets and it has attracted a great deal of attention among those using the station, particularly during the busy morning and evening rush hours. An electric sign, calling attention to this display, is in direct view of every one leaving the station concourse at the east-end stairway. A colored sign in the exhibit, points



Exhibit by the C. & N. W. in its Chicago Terminal

secure the business, either by his own or some other employee's influence and solicitation or by turning the information over to a regular traffic solicitor for handling. In most cases, the chairman of the traffic committees are switch crew foremen or assistant yardmasters, who are more or less closely in touch with the shipping clerks and traffic managers. Shippers are encouraged to attend the club meetings and do attend in large numbers. The results obtained in the way of increased traffic have been surprising and gratifying.

One of the most important objects, however, is contained in the motto of all of the clubs: "Know your fellow employee."

It is in the development of esprit de corps and loyalty that the clubs have served and are serving their major purpose.

THE WESTERN DIVISION of the Chicago Great Western has just closed a period of 195 consecutive days without a reportable injury. This is a new record for an operating division on this road.

to the fact that this equipment is installed complete from Chicago to Omaha. The mechanism case, which is located on top of the tender of the locomotive, is referred to in the exhibit as the "brains" of the automatic train control system, and this unit of equipment seemed to receive the greatest amount of attention because of the multiplicity of devices incorporated within it. Carrying the idea further, one of the posters refers to the receiver coils, which are located underneath the pilot, as the "eyes" of the train control system.

Booklet of Information

Further information relating to the North Western's automatic train control equipment is included in an attractive 12-page booklet, copies of which are distributed at the exhibits. Each unit is described and its function explained in brief non-technical language. Much is made of the fact that the train control system acts as an "invisible guardian" or "super-human engineman." The North Western has also "tied in" the two exhibits with its current advertising in the Chicago daily papers.

Block Signal and Train Control Hearing Ended

Roads ask to be left free to decide expenditures

WASHINGTON, D. C.

THE hearing before Division 6 of the Interstate Commerce Commission in connection with its investigation of the adequacy of existing installations of automatic block signals and automatic train-control devices was brought to a close on Monday, April 30, after representatives of most of the 168 respondent railroads had urged the commission not to issue orders requiring any further installations at this time. As in the case of the earlier days of the hearing, reported in the *Railway Age* of April 28, most of the roads emphasized the great increase in fatalities at highway crossings, as compared with improved safety in train operation, and cited the large capital expenditure which they had made for eliminating grade crossings and for other works designed to promote safety. Intention to extend automatic block signals was expressed and the need of other improvements, more pressing than automatic train control, was pointed out.

At the conclusion of the hearing R. H. Aishton, chairman of the executive committee of the Association of Railway Executives, presented a statement summarizing the views which had been presented and recommending that the issuance of any additional formal orders requiring the installation of automatic train-control or other forms of safety appliances be withheld at this time. He said in part:

Mr. Aishton Sums Up

Only ten passengers were killed in train accidents in 1927, making a low record for any one year and a decrease of 69 under 1926. An improvement in safety among employees was also reported in 1927. During the past eight years freight speed between terminals has increased 19 per cent, freight car-miles per day 20 per cent, and gross ton-miles per freight train-hour 47.5 per cent, with increased safety to those employed in the operation of trains; a growing indication that the efforts of the railways in directing expenditures to those things which will produce the greatest measure of safety have been productive of a commendable result.

In the past eight years the railroads have expended \$323,701,000 of new capital for safety purposes, of which all but \$22,395,000 has been expended voluntarily. These expenditures cover automatic and other signals, highway grade separation, and for the extension of automatic train-control beyond the two orders issued by the commission. The \$22,395,000 represents the cost of automatic train control devices installed in response to the orders of the commission.

Annual expenditures, including the operation, maintenance and retirements of safety appliances are estimated at \$89,663,000 for the year 1927. The safety organizations of the individual roads have done notable work in inculcating safety measures among their employees and also into the public attitude. For this work, large sums of money have been expended annually by the individual railroad managements.

Energetic and unremitting work has been done by the railways in the field of research, such as that now in progress at Purdue University on air brakes and at

the same time in getting a better and safer draft gear.

This information presents concrete and tangible evidence that the railroads generally, as their best judgment and a full sense of their responsibility dictates, are initiating and support such policies and practices, as will give the best safety results from available expenditures.

The duty of the railroads is not confined alone to that portion of the public using its rails. The number of highway grade crossings has increased in eight years by 7,858 or 3.5 per cent. Fatalities as a result of highway grade crossing accidents in 1927 totaled 2,371 or an increase of 32.4 per cent compared with the number in 1920. The entire record shows a consistent advance in safety to passengers and to employees, and that the railroads are working energetically and persistently at the problem of highway crossing safety, where there is certainly a divided responsibility between railroad managements and the public.

The Association of Railway Executives unanimously recommends that the issuance of any additional formal orders which require the installation of automatic train control, or of other forms of safety appliances, be withheld at this time.

Testimony of Individual Roads

Chicago, Burlington & Quincy.—A. W. Newton, chief engineer, speaking also for the Colorado & Southern and other controlled roads, supplemented the statement made in February. Expenditures to date on A. T. C. (Sprague system) have totaled \$211,341. Locomotive apparatus has cost \$769 per engine. It will be vital to have interchangeability, and no sweeping order should be issued at present. Crossing dangers are very costly; in five years the Burlington paid out \$1,343,679 in claims on this account. Expenditures for safeguarding the road are heavy on Western roads. In 18 years the Burlington has substantial permanent bridges for timber structures very extensively; in 1910 these temporary structures constituted 77 per cent of all bridges; now, only 56 per cent. Recounting roadway dangers that must be guarded against, the witness mentioned the bridge disaster due to an unprecedented flood at Casper, Wyo., in 1923; persons killed 35; personal injury damage bills \$238,495; damage to road and equipment \$125,299.

The Burlington is spending millions for elimination of grade crossings. These and other necessary improvements will this year cost \$7,022,777. Asked where, if additional automatic train control were ordered, he would put it (what division) Mr. Newton said he had not considered the question.

Representatives of the Chesapeake & Ohio and the Erie were to appear to testify on the third day.

Chesapeake & Ohio.—G. D. Brooke, general manager, told of the activities of the road in connection with automatic train control since 1916 when it installed the "American" ramp system. After equipping 61 miles and spending \$294,000 the apparatus was taken out in 1926 following the requirements of the general order.

The system now in use, intermittent inductive, with fore-staller, is satisfactory; cost to date, \$587,227. This road makes large expenditures for elimination of grade crossings; jobs now going on will cost \$1,960,963; others being considered, \$640,900. This year's budget for major improvements calls for \$9,849,100 of which \$1,294,000 is for signals and interlocking. A record of collisions for eight years shows 24 that theoretically would be preventable by automatic train control but most of these were at low speed. Reciting measures of safety of prior importance as compared with automatic train control Mr. Brooke included matters of personnel, morale and discipline, and he commended the Interstate Commerce Commission's published reports of train accidents. Additional automatic wayside signals are so important that no order should be issued at this time calling for automatic train control.

Erie.—R. C. Falconer, assistant to the president, described the Erie installations of automatic train-control. In 16 years only 20 persons had been killed in collisions on the Erie lines and there was no indication that any of these would have been prevented by automatic train control. He emphasized the importance of highway crossing elimination or protection. From 1920 to 1927, 553 persons had been killed and 3,330 injured in highway crossing accidents on the Erie and the automobile registration in the states it serves has been increased nearly three times. In that period the Erie has expended \$3,767,021 for the elimination of 26 grade crossings and \$242,675 in providing protection at 1329 crossings and the expenditures have been productive of results. M. A. Baird, signal engineer, was asked about the company's experience in testing different types of train control and said he had recommended that contracts be made for both the General Railway Signal Company's device and that of the Union Switch & Signal Company, but that the former had been selected. Asked if the contract provides that installations in the future shall be of the G. R. S. product he said he believed it did, but he was not familiar with the provisions in the contract.

Missouri-Kansas-Texas.—H. E. McGee, vice-president, asked to be relieved from any order. The company's passenger revenues have decreased 59 per cent since 1920. The company's capital needs for the ten years to 1936 include \$51,000,000 for road and \$26,000,000 for equipment including automatic signals for 500 miles. The M-K-T is actively urging local authorities to share with it the cost of elimination of many crossings.

Missouri Pacific.—E. A. Hadley, chief engineer, described the large expenditures of recent years, and said that \$5,000,000 will be required to complete the program of improving its line with reference to flood conditions. The road now has been earning less than the fair return and for 20 years has been operated for the benefit of the public and the employees because the stockholders have received no dividends. The company is providing more protection for the public than could be provided by automatic train control.

Texas & New Orleans.—L. H. Cecil, assistant to the president, said that the lines operated by this company have pursued a consistent policy of installing automatic block signals and have most of the main trackage so protected. The program for 1928 contemplates the installation of automatic signals between Falconia Junction and Giddings, 38 miles; 10 interlocking plants and the elimination of eight highway grade crossings. Attention was called to the large expenditure made in re-

cent years for improvements which tend to increase safety and to the intensive safety campaign conducted.

Cab Signals on Illinois Central

Illinois Central.—A. F. Blaess, chief engineer, told of the large expenditures made in recent years for block signals and other improvements which tend to promote safety and requested the commission not to issue any order at this time. The present installations of train control and block signals are adequate to meet the requirements of safety under the present volume of traffic. In the five years ending with 1926 the system has expended \$1,898,628 for automatic block signals, \$1,381,504 for interlocking, and \$9,275,717 for reconstructing 130 highway, street and railroad crossings. For this year the company contemplates installing automatic signals on 12 miles of the new line in southern Illinois.

Mr. Blaess described the company's use of cab signals without wayside signals and said that the fact that the cab light signals are in plain view of the engineman at all times, regardless of weather conditions, is of more value than all other features of automatic train control. E. E. Von Bergen, general air brake inspector, introduced affidavits signed by 59 enginemen of experience on the two divisions on which the cab signals have been installed in connection with automatic train control. The typical statement was that they had found the system safer and to facilitate the movement of trains to a greater degree than the system using wayside signals. The cab signal is always in plain view but it is not necessary to watch it continuously. They said there is no necessity for wayside signals except at "stop-and-stay" locations.

St. Louis-San Francisco.—J. E. Hutchinson, vice-president, said that if the principal reason for automatic train control is the protection of the traveling public 72 per cent of that reason has disappeared since 1920 because the number of passengers carried by the Frisco lines has decreased by that percentage. The 1928 budget includes \$320,000 for automatic block signals on 120 miles but he did not believe that the results of automatic train control installation had justified the expense. The net result to date is a first cost of \$243,658 and about \$22,440 a year maintenance cost.

Florida East Coast.—L. C. Frohman, principal assistant engineer, said that from 1923 to 1927 his company had spent \$1,547,423 for automatic block signals and \$25,997,925 for improvements which directly tend to promote safety. Any further expenditures at this time for safety are not only unnecessary but would be unreasonably burdensome to the company.

Grand Trunk.—L. J. Carrigan, assistant general attorney, said that in view of the much greater danger at highway crossings as compared with those arising out of train operation the company's money could be used to the best advantage at crossings. During 1928 the installation of automatic block signals is contemplated on the Grand Trunk Western 50 miles east from Grangers, at a cost of \$150,000.

Great Northern's Extensive Plans

Great Northern.—C. A. Dunham, signal engineer, said that since March 1, 1920, the mileage equipped with automatic block signals has been increased from 1,169 miles of track to 2,157 road miles and 2,741 track miles, at an expenditure of \$2,770,815 for installation and \$2,049,004 for maintenance. The officers believe that the automatic signal and train control installations are now adequate and they desire to be permitted to

spend available money for such improvements as they consider will bring the best results. In the extension of the electrification through the Cascade tunnel during 1928 it is proposed to replace the semaphore signals with color light signals and to adapt the track circuits for alternating current at a cost of \$145,000 and during 1929 it is expected to install automatic signals between St. Cloud and Moorhead, Minn., 166 miles, at a cost of about \$350,000. With approximately 3,000 miles of automatic block signals in use, some of them more than 20 years, the Great Northern has never killed a passenger in a train accident in automatic block signal territory.

Louisville & Nashville.—Sidney Smith, general attorney said that in the last 20 years this company has expended over \$100,000,000 in rebuilding and improving its lines, including (in the past five years) \$2,667,593 for automatic block signals, automatic train control, interlocking plants and signals. Automatic block signals have been installed on 46 per cent of its main line mileage and the company definitely contemplates the installation of additional block signals (510 miles) but feels that the expense of automatic train control is not justified. Any compulsory installations beyond those now authorized would compel the diversion of funds from projects of greater importance. Mr. Smith expressed the opinion that the safety attributable to automatic train-control in addition to that obtainable from automatic block signals is negligible and does not justify the cost. Since 1.55 miles of road could be protected by automatic block signals for the expenditure necessary to construct one mile of automatic train-control, there is nothing in the situation which justifies the management in concluding that train control installations are either necessary or desirable at this time.

Chicago & Eastern Illinois.—F. G. Nicholson, vice-president and general manager, described this company's experience with the Miller train-control, saying that 19.6 per cent of its passenger mileage and 56.4 per cent of its road locomotives are equipped with automatic train-control. Considering the depressed condition of business and the relative freedom from train accidents, he expressed the opinion that this installation is entirely adequate.

New York, New Haven & Hartford.—Charles E. Smith, vice-president, said that while the company is not opposed to train control, it is of the opinion that expenditures on its system for other purposes will provide a greater measure of safety. It has no record that train-control has prevented an accident and fatal accidents on the New Haven were 70 per cent less in 1927 than in 1913. No passengers have been killed in train accidents since 1916.

Increase of 35 Per Cent Not Justified

Northern Pacific.—H. E. Stevens, chief engineer, said the company feels that its investment in automatic block signals, (\$5,430,000) with an annual maintenance cost of approximately \$500,000, has been money well expended but that on a road of the average train density of the Northern Pacific to increase the cost by 35 per cent merely for the purpose of insuring that the signal instructions are obeyed is an unjustified expenditure.

Seaboard Air Line.—W. D. Faucette, chief engineer, said this company has installed 500 miles of automatic block signals since 1924 at a cost of \$3,205,000, and has under consideration the extension of the system between Hamlet and Monroe, about 60 miles, and for about 20 miles in the vicinity of Tampa. A requirement that it

install automatic train control would make it impossible to extend the visual signal system and the use of other safety devices and the company asks to be exempted from the order of January 14, 1924, which was suspended.

Southern Has 2,718 Miles in Use

Southern.—W. J. Eck, assistant to the vice-president, said the Southern system now has 3,048 miles of road equipped with automatic block signals and 2,718 miles of road and 868 locomotives equipped with automatic train control. In 1925, 1926 and 1927 it has expended \$10,482,398 for automatic signals and train-control and the voluntary installations of train-control are equal to approximately 17 locomotive divisions or 2,300 miles. What has been done voluntarily, he said, should serve to warrant the conclusion that the management will provide adequately for installations on additional sections of line as the development of traffic, use, and train density may seem hereafter to require.

Southern Pacific.—W. L. Boland, signal engineer, said the Pacific Lines of the Southern Pacific system have 3,891 miles of road protected by automatic block signals, a greater mileage than any other line in the country. During 1926 and 1927 additional capital investment in automatic train-control, interlocking and block signals totaled \$3,167,608, adding 369 miles of automatic block signals, and for 1928 work has been started on projects which call for an additional capital investment of \$850,000 for interlocking and block signals on 220 additional miles. It is the judgment of the officers that no section of its lines has yet reached a stage of traffic density and character such as to justify an installation of automatic train-control.

Texas & Pacific.—E. F. Mitchell, chief engineer, said that the budget for 1928 includes installation of additional automatic block signals on 644 miles of road, which will increase the percentage of its main line so equipped to 71.9. It also includes installation of automatic block signals on 20.4 miles of second main track to be built between a point 12 miles west of Dallas and Fort Worth. The estimated cost for 1928 is \$2,067,470. In view of the extensive program and heavy expenditures the company requests that the commission impose no order upon it.

Wabash.—S. E. Cotter, vice-president and general manager, said that his program for 1928 includes the installation of automatic block signals on 19.4 additional miles of double track, but that under existing traffic conditions the large sums which would have to be expended for automatic train control would not produce commensurate results in the reduction of casualties as if expended for other safety measures.

Government Order Has Delayed Improvements

Union Pacific.—A. H. McKeen, signal engineer, said the total investment of the system in automatic block signals is \$7,951,980, in interlocking plants, \$1,498,000, and in automatic train-control, \$1,018,000. For 1928 the installation of block signals on 126 miles of second main track has been authorized. All of the main lines are equipped with automatic block signals and the company is working toward equipping the secondary lines as conditions justify. He expressed the opinion that the program is more comprehensive than any order the commission might reasonably make and said that when traffic conditions justify it the Union Pacific is willing to go ahead voluntarily with the installation of automatic train-control. Meanwhile it is gaining valuable experience with the present installations, which are not

needed at the present time, and the cost of which has delayed the automatic signal program.

Delaware & Hudson.—A. H. Rice, signal engineer, said that all main line mileage is equipped with automatic block signals, and that automatic train control has been installed on the mileage over which 71.2 per cent of the passenger mileage is operated.

Norfolk & Western.—W. J. Jenks, operating vice-president, said that 72 per cent of the track mileage and 90 per cent of the passenger mileage is protected with automatic block signals and he asked that the company be permitted to exercise its best judgment as to expenditures.

Reading.—P. S. Lewis, superintendent of the Atlantic City division, urged the desirability of postponing any further requirement as to automatic train control until more experience has been had with the various types as to interchangeability, saying that the Reading is so situated that any extension would require it to equip a large portion of its locomotives.

Alfred P. Thom, general counsel of the Association of Railway Executives, made a brief concluding statement, urging the commission not to issue any order at this time. C. A. McHenry, representing the Hudson Automatic Train Stop and Train Control Corporation, and J. F. Webb, of the International Signal Company, described the operation of their devices in test installations on the Richmond, Fredericksburg & Potomac and the Erie, respectively, and complained that railroad officers have not given them an opportunity. Mr. Webb said he knew of only two reasons—"the Union Switch & Signal Company and the General Railway Signal Co."

Frank J. Sprague and other representatives of train-control companies were authorized to file written statements and the hearings were declared closed, unless the commission shall desire to have additional evidence.

Speed and Safety

SPEED and safety on the railways is the subject of a paper which was read before the Institute of Transport (London) on February 6, by Raymond Carpmal, assistant engineer of the Great Western Railway. The paper, while discussing, as its primary point, the question of safety as related to the large number of very fast passenger trains now run by the English railways, takes up the subject from the beginning of iron roads and deals carefully and in considerable detail with railway construction in England during the past fifty years. Questions of operation are also touched upon though rather briefly.

While the paper consists largely of recent historical notes, which are matters of record and with which readers of the *Railway Age* are measureably familiar, the article, which is published in the *Journal of the Institute of Transport* * for April, is of value for its comparisons with American and Continental speeds.

A half-dozen appendices give data concerning inspection and testing of materials, and abstracts of British accident records for the past 23 years. In train accidents, the average number of employees killed, annually, is less than eleven, and of passengers, (excluding 224 soldiers killed at Quintinshill during the war) is less than nineteen. The average of passengers killed in collisions annually for 23 years is 11.9.

In the discussion following the reading of the paper before the Institute, various interesting incidents were

brought out. H. A. Watson, referring to the remarkable record for safety in connection with passenger trains in Great Britain, thought that statistics should be compiled respecting the safe conveyance of goods; that some railroad managers would find figures in this record much more disquieting than those relating to passengers.

V. M. Barrington-Ward congratulated the railways of Britain on their good fortune in having to deal with the British Ministry of Transport as compared with the plight of the roads in America which are in the clutches of the Interstate Commerce Commission, a "ministry" which sends out a legion of inspectors. Englishmen should be thankful, not only as railway men, but as tax-payers, that there is nothing like the Interstate Commerce Commission in that country. Criticising a statement of Mr. Carpmal about block working, Mr. Barrington-Ward referred to the fact that there is a single-track line in England (in South Yorkshire) which is operated entirely under the control of track circuits, meaning, presumably, automatic roadside signals. Commenting on the safety of track circuit signaling, the speaker referred to his surprise, when in America, at seeing a gasoline track car operating with insulated wheels and not protecting itself by the fixed signals. The speaker questioned extreme statements about the safety of English signaling, citing cases where sand on the rails had prevented an automatic signal going to the stop position, and others where a mechanical distant signal had stuck in the clear position because of snow or frost. He quoted American railroad men as condemning automatic train control because of its high cost; but a government official in Washington had told him that all the railways liked it because it was good for advertising purposes. Running freight trains very fast and then bringing them up to a yard which is not large enough to receive them, is one of the absurdities of present "progress" to which the speaker called attention.

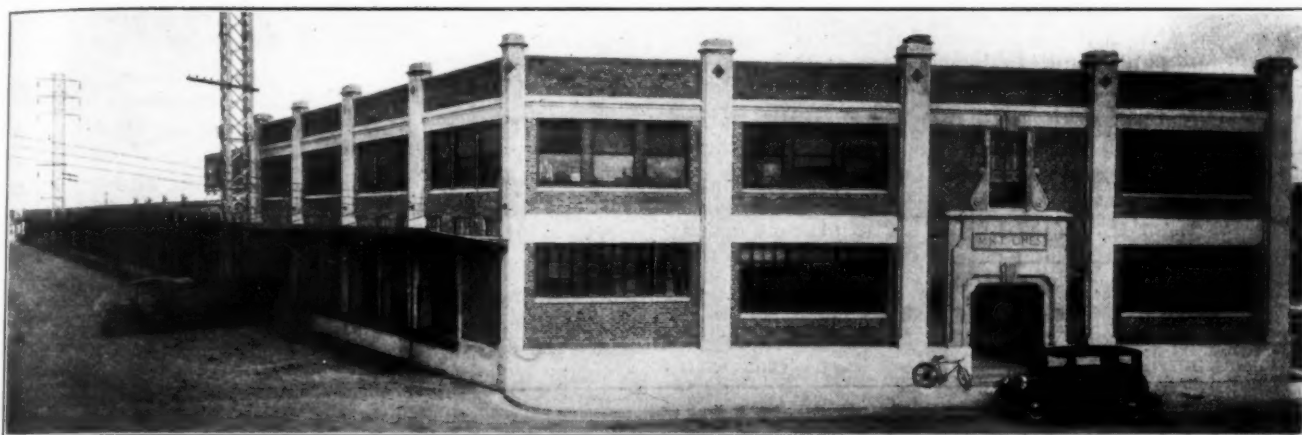
C. E. R. Sherington, referring to safety programs enforced on railroads by governmental authority, pictured a time when the excessive expenditures involved might result in government ownership or in bankruptcy. He was quite sure that the recent American action on automatic train control, if applied in England, would have produced such a result. Experiments with automatic train control in Germany, referred to by Mr. Carpmal, deal with apparatus, says Mr. Sherington, which is totally different from the American system.

What is the economic limit of speed? It is recorded that the Shah of Persia, when in England, wanted to ride at ten miles an hour, and when he found that this rate had been exceeded, demanded the instant execution of the engineman. On the other hand, proposals to run express trains at 120 miles an hour have been put forward seriously. The economic limit, said Mr. Sherington, is impossible to define. The Royal Scot, London to Carlisle without a stop, has been recently quickened by 15 minutes, partly by taking out certain stops. Was the speed of this train economic before the alteration or is it economic now? On the East Coast route, a train from London to York and one from York to Edinburgh together make the time in 7 hours, 34 minutes, whereas the fastest through time, London to Edinburgh, is 8 hours, 15 minutes. On what economic ground is that difference of 41 minutes to be explained?

The question of safety cannot be separated from that of speed. The author of the paper in his modesty concerning his own road, omitted to mention that the Great Western had not for 23 years had a passenger train accident involving loss of life.

Nigel Norman of the Metropolitan Railway spoke favorably of the four-aspect, color-light signals now being introduced on the Southern Railway.

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The New Freight House Presents an Attractive Appearance

M.-K.-T. Has New Freight Terminal at Houston, Texas

Develops new location capable of considerable expansion with increase in traffic demand

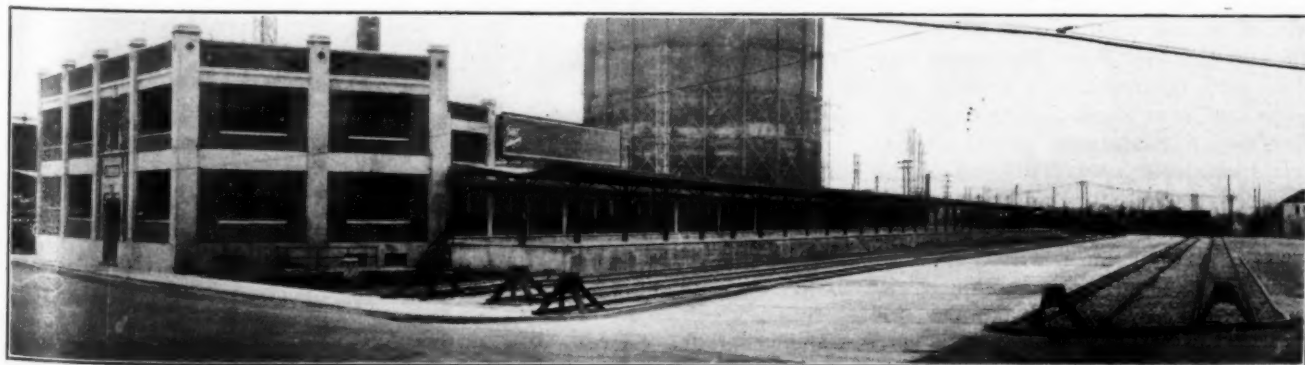
THE rapid commercial and industrial development of the Southwest has presented some interesting problems to the railroads in their efforts to provide adequate facilities for handling the increasing freight business in the more important cities and towns. The Missouri-Kansas-Texas Lines have faced this problem for several years at Houston, Tex. Their old freight house was centrally located, but practically the only team or truck outlet from this station was Main street, the busiest north and south thoroughfare in the city. Further expansion was impossible except at great expense because the site was hemmed in by Main street at the east end, the locomotive and car facilities at the west end and White Oak bayou on the south side.

After much consideration authority was granted for the purchase of a new and independent site about ten blocks east of Main street, upon which a complete new layout, including house tracks, team tracks, a new reinforced concrete freight station, a covered concrete transfer platform and a wood frame automobile platform, has been constructed at a total cost, including land, of about one million dollars.

The site is in the midst of an old residential district, which is gradually being taken up by small industries and warehouses. It is centrally located and conveniently accessible to both the wholesale and the industrial districts. It is also located conveniently near the new Navigation boulevard and other main thoroughfares leading to the ship channel turning basin. In January, 1927, the last of about fifty old residences and other buildings were removed and on July 14, a contract was signed for the construction of a new station. The facilities were completed and turned over to the operating department on December 15.

New Facilities Are Well Located

The site is an irregular shaped area with its main axis north and south, bounded by Gable, Magnolia and Hamilton streets and the main line of the Galveston, Houston & Henderson (in which the M-K-T owns a half interest). The freight house lies along the west side of this area with a frontage of 600 ft. on Gable street and 80 ft. on Magnolia street, while an automobile platform served by two tracks is located at the east side. House and team tracks occupy the larger part of the space



The New Station as Seen from the Team Yard Side

between, and have a connection with the main track at the northwest corner of the plot.

The new freight house is used as a combined inbound and outbound house with tailboard space on Gable street, which will have a brick pavement 80 ft. wide affording ample space for trucks and wagons without interfering with street traffic. The house is served by six tracks, divided into two groups with a 16-ft. covered transfer platform between them. To the north of these there are three team tracks. However, it is planned whenever increase in business demands, to build an outbound freight house east of the east house tracks (in which case the present building would be used exclusively as an inbound house, and develop the now unoccupied portion of the property as a team yard.

Building is of Substantial Construction

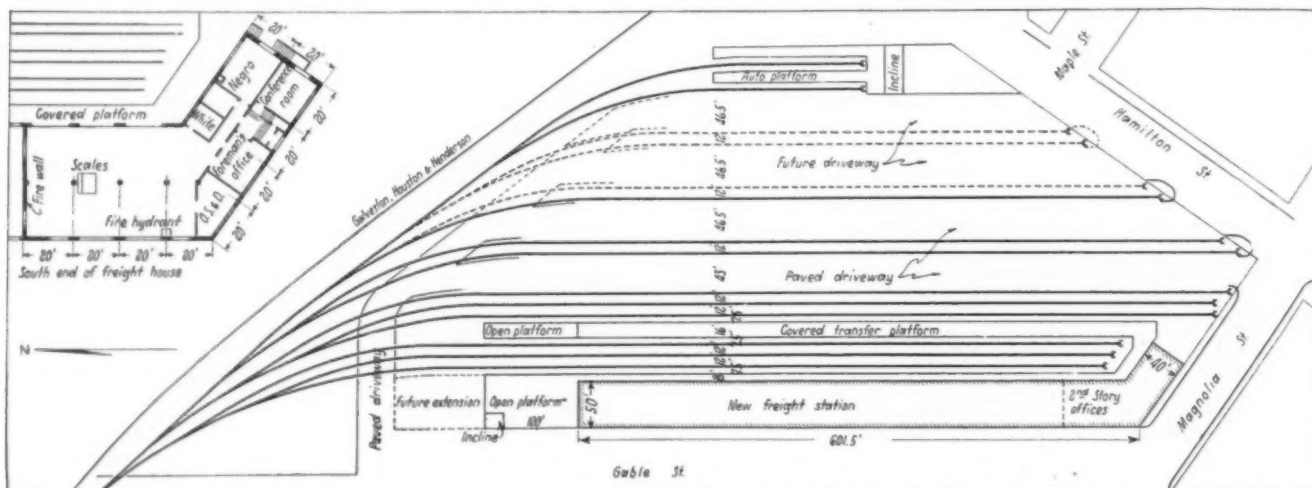
The building is of reinforced concrete construction. The freight wareroom, 600 ft. by 50 ft., has a mastic floor with concrete base on earth fill. There is an open platform, 100 ft. by 58 ft., at the north end of the

is completely equipped with steel shelving, steel desks and steel chairs. An oil-burning steam heating system is provided, equipped with oil storage capacity for one year's supply of fuel.

The layout contains 11,000 ft. of tracks. The house as well as the team tracks of each pair are spaced 12 ft. center to center. The team tracks are served by two driveways, one of concrete, 33 ft. wide and the other of brick, 36½ ft. wide.

The automobile platform is served by two tracks with provisions for both side and end loading of cars. The teamway track crossings are paved with asphalt macadam and the tracks are ballasted with shell. The entire construction is designed with a view to obtaining reduced maintenance cost.

The layout and construction plans were developed and designed in the Missouri-Kansas-Texas Lines engineering department and the entire project was carried out under the direction of F. Ringer, chief engineer. The building was designed and supervised by A. L.



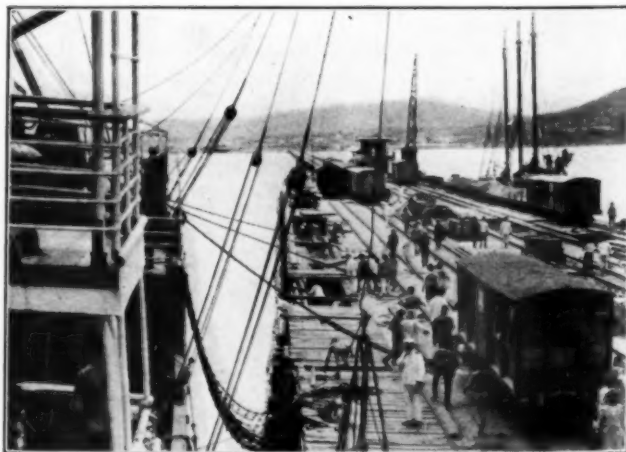
The Site of the New Terminal Affords Opportunity for Future Enlargement

wareroom and a platform 8 ft. wide, along the track side. These and the transfer platform have monolithic finished concrete floors on earth fill. The wareroom is equipped with six automatic scales, constructed in accordance with the specifications of the A.R.E.A.

No wood was used in the construction of the building except for interior trim in the office portion. The wareroom is completely enclosed on the two sides with heavy, rolling steel doors and steel sash and is protected from the weather by overhanging awnings of structural steel covered with corrugated asbestos. The transfer platform, also, is covered with a butterfly shed constructed in like manner. At the south end of the wareroom on the first floor, provisions have been made for white and colored men's toilets, lavatory and locker rooms, an "over-short-and-damaged" room, a foreman's office and a conference room, all newly equipped for their special purposes. This end of the building has an L-shaped, second story addition with brick walls, which houses the offices. These are entered by a rather attractive street entrance, with a stairway and hall walled with enameled brick and floored with quarry tile. Hollow tile partitions, Kalamein doors, rolled steel, double-hung windows with copper screens and venetian blinds are used to decrease maintenance expense. The floor is covered with battleship linoleum and the office

Sparks, architect, with B. A. Underwood, assistant engineer, in direct charge of the work. The building and structures were erected by T. H. Johnson, contractor of Sedalia, Mo., and all track work was done by the railroad forces.

* * *



Concrete Pier at Puerto Colombia, Colombia, from Where Freight Is Carried 30 Miles Inland to Barranquilla for Transhipment to the Interior by Boat

Air Brake Association Meets at Detroit

Discussion of effect of train braking on car wheel failures is feature of four-day meeting

THE Air Brake Association opened its thirty-fifth annual convention at the Book-Cadillac Hotel, Detroit, Mich., on Tuesday, May 1, with a registration of nearly 700. F. H. Hardin, assistant to the president, New York Central, New York, made the opening address.

F. H. Hardin's Address

In his remarks, Mr. Hardin pointed out that the country had only developed as its transportation had developed and, in discussing the part played by the air brake in the growth of railroad transportation, he said that the ability to operate the long trains we have today depends entirely on the ability to stop. However, ability to do this should not lull us into a sense of security, he said, as the number of cars that can be hauled in a train has not reached its limit. As progress is made in operation and in the design of other parts of the equipment, developments in the air brake must continue. He said that undoubtedly the tests being conducted at Purdue University would add to the development of the air brake.

Commenting on the work that the association is doing, Mr. Hardin said he thought that the proposal to extend the cleaning period of air brakes from 12 to 18 months should receive serious consideration. It was his opinion that one of the most important questions before the association was the recommendations incorporated in F. K. Vial's paper on the standardization of braking power of freight cars which was presented at last year's convention at Washington, D. C. Mr. Hardin stressed the need for mutual frankness in the discussion of Mr. Vial's paper, especially on those points where the committee differed with the author. He said that although he did not believe that all our wheel trouble was due to bad braking radio conditions, he did believe that such conditions were an important factor.

Mr. Hardin closed his remarks by stressing the need for training young men entering railroad work. He said that there were three reasons for young men not wanting to enter railroad work, and these were the severity of the conditions under which they were required to work, low salaries and slow promotion. College men do have an advantage over non-college men on account of their training, but because a man is a college graduate, does not, in his opinion, constitute a good reason for showing him preference over the non-college man, especially when the latter has proved his ability. It was his opinion that both the college and non-college man should start on the same footing and receive equal consideration. Although hard knocks are an essential factor in any young man's training, he should get needed help at the opportune time. Many men have the ability, but lack the necessary initiative, but when the first quality is present, the latter can be developed. This feature, he said, should not be overlooked by department heads when selecting and training their successors.

Other Addresses

In making his presidential address, H. A. Clark, general air brake inspector, Soo Lines, briefly reviewed the work that has been done by the association during the

past few years. In this review, he said that greater efficiency in air brake work must be attained in order to keep the association in creditable standing with the railroad industry. It was only through actual accomplishment, evident to the executive and mechanical department heads, that the railroads would be induced to send their men to conventions.

During the morning session, President Clark called on W. B. Borland, director of the Bureau of Safety, Interstate Commerce Commission, to address the convention. Mr. Borland, speaking extemporaneously, told of the difficulties encountered 25 years ago in inducing the railroads to accept the requirements adopted by the Safety Bureau for air brake equipment and compared the difference in the attitude at that time with the railroad policy of today. This change, he said, was due primarily to the results obtained from tests and experiments which revealed the real possibilities of the air brake. He related how it was shown that the railroad could secure better operation and save money through compliance with the regulations pertaining to installation and maintenance. It was his belief that the air brake tests now being conducted at Purdue would result in improved equipment, better standards of maintenance, and that the railroads would find the results well worth the money expended.

Report on Standardization of Braking Power of Freight Cars

At the 1927 convention a paper was presented by F. K. Vial, vice-president and chief engineer of the Griffin Wheel Company, entitled "Standardization of the Braking Power of Freight Cars." This paper was turned over to a committee for analysis and study, the committee to report to the association at the 1928 convention. The complete report of the committee covers the results of a painstaking analysis of Mr. Vial's paper, the committee drawing attention to many points in the paper with which it cannot agree. Mr. Vial maintained that the wide variation between light and loaded weights of freight cars, and in the loaded weight itself, makes the problem of providing suitable braking power difficult, that the braking power adopted as standard for different types of freight cars does not meet the average operating requirements and that in this condition lies the cause of the majority of wheel failures. This, he said, is particularly so in the case of refrigerator cars.

The committee's findings are summed up in the following discussion of the remedies proposed by Mr. Vial and in its own recommendations relative to the maintenance of the present A.R.A. standard braking ratio. An abstract of this portion of the report follows.

Mr. Vial's Three Recommendations

First—Cars with steel wheels should have a braking ratio 25 per cent higher than those with chilled iron wheels.

We cannot accept this recommendation, as the facts in the case thus far developed do not warrant it, because: first, there does not now appear to be any constant difference in co-efficient of friction between the

two types of wheels; second, this difference is small and unimportant when compared with the differences in the coefficient obtained with different brake shoes, or even with the same brake shoe under different conditions; and third, it involves different sets of foundation brake levers on the same series of cars, depending on the type of wheel used, and a change in wheels would involve a corresponding change in the brake rigging with the added burden of inspection and maintenance.

Second—Brake levers should be standardized and the proper levers stencilled on the side of the car.

This is an excellent recommendation, and one that has been made many times before; but unfortunately lever standardization is impracticable. A mere glance at the car builders' numerous drawings of brake levels will indicate the enormous variety that they have had to furnish in order to meet the differences in car construction now required by different customers, and it would be futile to attempt to reduce them all to a few standard sizes under present conditions. This, however, need not prevent some proper indication of the correct size of levers being applied to every car, and we heartily endorse this part of the recommendation.

Third—The braking power of cars of any capacity should have a much smaller range than indicated by the extreme variation in weights of the cars of that capacity.

On account of the indiscriminate use by the author of that term "braking power" all through his paper, we are in doubt as to whether he is referring to braking ratio or to brake shoe pressure in this recommendation. At any rate, if every car is to be provided with a brake that will enable it to control itself under all conditions of service, the brake shoe pressure will be governed entirely by the required braking ratio; and the braking ratio is determined in every case by natural laws and stop or grade requirements. Since the braking ratio must be a percentage of the car weight, we do not understand how its range can be properly reduced except by reducing the range of car weights.

Why Do We Not Maintain the Present

A. R. A. Standard Braking Ratio?

In the course of our analysis of Mr. Vial's paper, we investigated the condition of foundation brake gear on a considerable number of cars in general freight serv-

Summary of Braking Ratios Found on 1,987 Freight Cars in General Interchange

| Braking ratio, per cent | Number of cars | | Percentage of total | |
|-------------------------|----------------|---------------|---------------------|---------------|
| | Trucks equal | Highest truck | Trucks equal | Highest truck |
| Less than 30... | 4 | 4 | 0.20 | 0.2 |
| 30 to 40 ... | 17 | 18 | 0.86 | 0.9 |
| 40 to 50 ... | 56 | 81 | 2.82 | 4.1 |
| 50 to 57½ ... | 334 | 413 | 16.80 | 20.8 |
| 57½ to 62½ ... | 494 | 716 | 24.80 | 36.0 |
| 62½ to 70 ... | 242 | 401 | 12.20 | 20.2 |
| 70 to 80 ... | 87 | 188 | 4.40 | 9.4 |
| 80 to 90 ... | 40 | 78 | 2.00 | 3.9 |
| 90 to 100 ... | 15 | 37 | 0.76 | 1.9 |
| Over 100 ... | 19 | 51 | 0.96 | 2.6 |
| Total | 1308 | 1987 | 65.80 | 100.0 |

ice, to ascertain what variations from standard braking ratio are regularly met with. It has frequently been stated that great variations were occasionally found, but we had no idea of the seriousness of the situation, due to the extent and tremendously wide variations from standard that now exist.

We have measured the levers on nearly 2,000 cars and figured the braking ratio for each. We assumed that any car having both trucks braked within the range between 57½ per cent minimum and 62½ per cent maximum with 50 lb. cylinder pressure was accepted as standard. We then tabulated the braking ra-

tios found for each truck, and also the average for the car. It is understood that the "B" end of the car is that toward which the brake cylinder push rod moves when applying the brake, and therefore, the end upon which the hand brake is placed. The other end is designated as the "A" end. The results of this investigation, made on cars in all parts of this country and taken at random in trains and yards, are summarized in the following table, both for cars having the same ratio on both trucks, and also for the truck having the highest ratio, which includes those having a considerable difference between the two trucks.

In analyzing these figures, it will be noted that 65.8 per cent, or practically two-thirds, of the total number, had the same ratio on both trucks. The other third had a wide range of differences between the two ends. Of the total number of cars, 1,987, there were 494, or about 25 per cent, that were standard. All the rest varied from it either in the average for the car or in variation between trucks.

In our judgment, this condition of brake gear, more than any other one cause, is responsible for a large percentage of damaged wheels, brake gear failures, bent brake beams, burned brake shoes and heads, break-in-twos and bad slack action in freight service. What is the use of talking about adopting a new standard for braking ratio when we have failed so largely to maintain the one we have? Apparently the thing to do now is to try and ascertain what will happen when the present standard is properly maintained.

The Committee's Recommendations

In view of the above considerations, we make the following recommendations:

First—That no variation in the braking ratio be allowed due to the difference in the empty weights or carrying capacity of cars, since uniformity is obtained to the maximum degree when the empty cars all have the same braking ratio.

Second—That no differential be adopted at the present time in braking ratios because of the materials used in wheels or brake shoes, nor in the future until definite constant differences in the frictional characteristics of those materials are determined. And then, when such differences are determined, no reduction in the braking ratio of any car below that now standard should be permitted, the differential operating only to bring the lower frictional materials up to the standard of the highest.

Third—That we recommend to the A. R. A. that it be made standard practice for cars in general interchange to be supplied with a foundation brake gear plate permanently attached to the car underframe near the brake cylinder in a conspicuous and accessible location, which will contain in an indestructible form the necessary information to enable correct replacement of both body and truck levers.

Fourth—That, as soon as this plate is applied, the car inspectors at all repair points be instructed to check up the brake gear on all cars on the repair track by reference to this plate, at the same time that the brake is tested, and substitute correct levers whenever wrong ones are found. Also, that the A. R. A. make suitable addition to the rules of interchange to indicate the proper billing for this work on foreign cars.

Fifth—That a vigorous campaign be inaugurated as soon as possible to correct the appallingly chaotic condition of leverage which apparently exists at the present time by bringing the braking ratio of every car within the range between 57.5 per cent minimum and 62.5 per cent maximum with 50 lb. cylinder pressure.

The wonderful improvement that has recently been achieved in the condition of the air operating devices should be followed by an equally effective improvement in the maintenance of foundation brake gear.

The report was signed by C. H. Weaver, (N. Y. C.), E. VonBergen, (I. C.), Mark Purcell, (N. P.), W. H. Clegg, (Can. Nat.), G. H. Wood, (A., T. & S. F.), H. A. Clark, (Soo Line), E. F. Wentworth, (New York Air Brake Co.), and F. H. Parke, (Westinghouse Air Brake Co.), Chairman.

Discussion

It was evident from the discussion of the report of the committee appointed to study Mr. Vial's paper on the standardization of the braking power of freight cars, that there was considerable misunderstanding as to the use of the terms "braking power" and "braking ratio" in the paper. A number of the speakers did not agree with Mr. Vial's conclusions that refrigerator cars were the most prolific source of wheel trouble owing to irregular and excessive braking power which, according to his paper, exceeds that of the 70-ton freight car. It was pointed out that refrigerator cars are not braked any higher than other cars, but it takes more brake shoe pressure to brake them equally with cars of lighter tare weight. One of the speakers gave figures taken from records compiled by his road which showed that wheel failures did not appear to have any relation to the type of car. In fact, records taken during one period showed a substantial number of wheels failing under open top cars of various capacities.

Mr. Vial, speaking in defense of his paper, stated that in his calculations and recommendations he assumed that the wheel was as much a part of the braking equipment as the triple valve. He regretted that the committee did not deem it advisable to pass favorably on his proposals with respect to braking ratios. The committee's recommendation, however, to attach plates to freight cars showing the brake lever dimensions he believed would be a big help in reducing the number of wheel failures.

It was the consensus of opinion that Mr. Vial had performed a very constructive piece of work in calling attention to the wheel situation and that he had not only pointed out a serious condition in railway operation, but had assisted materially in the work of arriving at a solution of the problem.

Relation of the Air Brake to Slack Action and Shocks in Trains

Contributed by the Pittsburgh Air Brake Club

The factors entering into the production of shocks in long trains, by the making of brake applications, are:

1—Amount of and rate of developing braking force at the head end of the train; amount of brake application, brake pipe leakage and piston travel.

2—Throttle manipulation.

3—Track condition, as to grade and curvature.

4—Speed.

5—Free slack between cars.

6—Type and condition of draft gear and attachments.

All factors being the same, the amount and rate of braking effort developed on the head end of a train in advance of that developed on the rear determines the difference in impact velocity created when the slack runs in, and therefore the severity of the resulting shock. When the brakes are applied from the locomotive, they apply serially from the head end toward the rear end which results in the head end being retarded first. The time of serial application is a little shorter with a heavy reduction than a light one, but nevertheless the retardation set up on the head end is greater in proportion as

the initial brake application is heavier. It is for that reason that the split reduction is so generally resorted to in order to allow the slack to close in and adjust itself gradually.

Brake pipe leakage is a highly important and most serious factor in increasing the rate of developing retardation and, therefore, in causing shocks. Naturally the more leakage the less control the engineman has over the rate and degree of brake pipe reduction and particularly in the front portions of trains. Thus differences developed in the retarding force between the front and rear will be greatly increased. This is one of the best reasons for keeping brake pipe leakage to the lowest possible figure since it is one of the factors that can most readily be controlled.

Variations in piston travel varies the retarding force developed with any given brake pipe reduction so that in extreme cases it may be the cause of bad slack action in the train. This cause is, of course, beyond the control of the engineman and no change in service brake manipulation can fully overcome it, particularly, where combined with heavy brake pipe leakage. The recent change in the A. R. A. specifications for piston travel from 6 inches to 8 inches, to 7 inches to 9 inches will be highly beneficial if it is carefully observed. This change clearly makes for a more flexible and smoother brake for level road service. Contrary to the belief of many, it makes for better flexibility and equal safety for grade service.

The less the load in the freight car, the greater the retarding effect of the brake on that car. Therefore, with empty cars on the head end of a train greater shocks are liable to result due to brake application than where such cars are loaded. Loads on the rear end with empties ahead would result in greater shocks than with an empty train, due to the greater weight of the loaded cars behind. With loads ahead and empties behind, the shocks due to slack runnings in are not likely to be so severe because of the lower braking ratio of the loaded car. However, as the loaded cars would start to brake more quickly, the slack will still close in. On the other hand, if the initial speed be high enough to allow time for a reversal of slack, due to the more effective braking power of the empty cars on the rear, there is a possibility that the slack may run out again with sufficient force to part the train. This is also another reason why the split reduction is usually found of great advantage.

Braking with the open throttle is common practice as it has a tendency to minimize the retarding effect of the brakes on the head end and reduce the danger of shock from the rear cars running in and then running out hard. While there are some differences of opinion as to the manner in which the throttle should be handled at such a time, there does not seem to be any question but that it is a decided assistance in handling the slack.

Another consideration of great importance is that of track condition at points where brake applications must be made. Curvature and grade are factors which have a very important bearing on the amount and type of brake operation. Making a brake application with the head end entering a sharp curve or on an ascending grade with the rear end on straight level track, or descending grade creates a condition where the engineman must take special precautions satisfactorily to control the rate of closing the train slack. These are conditions which have to be met by good judgment combined with a knowledge of the position of the slack at the time and place where the stop is to be initiated.

There is usually a critical speed for a given set of

conditions as to train make-up, brake pipe leakage, road bed, etc., where shocks, due to slack action, will be the maximum. This is usually a fairly low speed and it should be the practice under such speeds to handle the brake with great care. For the critical condition, the head end will be just brought to a stop at the instant the slack closes in at the rear. When the speed is lower than this critical point, the energy in the train is less and results in reduced shock as compared with the critical speed. On the other hand, if the speed is higher, the retardation at the head end will be at a lower rate, due to lower brake shoe friction, and consequently the shock will be less.

Other things being equal, the greater the amount of slack the higher the critical speed will be and the greater the possibility of damage due to shock. It may be said without question that the amount of shock possible to obtain, increases in severity in proportion to the amount of slack. Slack of itself does not create shock, but if there were no slack there could be no shock.

Investigations have been made recently on several railroads which have revealed an undesirable condition of slack and draft rigging. The slack in a large number of freight trains has reached a point where, under critical track conditions, it is conducive to rough handling and in some cases break-in-twos.

Air brake supervisors have been kept busy formulating rules for handling these trains and it now seems that their ingenuity has become exhausted. We feel, therefore, that it is time to call attention to this condition with the hope that some action can be taken at this convention to bring the question of loose train slack and value of draft gear up for the consideration of the American Railway Association.

During a recent investigation on an Eastern railroad, it was found that in a train of 95 loaded coal cars, there was as much as 100 ft. of slack. In an investigation on another Eastern road, it was found that the slack ranged from 49 ft. per 100 cars, as the best condition encountered and involving a train of comparatively new cars, to a maximum of 103 ft. The average for 14 trains, taken at random, was 70 ft. Of course, these figures for slack do not represent free or unresisted slack alone, because the measurement was taken by slackening a road engine back, then forward, with the rear end of the train anchored by a helper engine. Recently some 363 passenger cars in 31 different trains were investigated to determine the free slack existing in couplers and it ranged from $\frac{1}{2}$ inch to $2\frac{3}{8}$ inches per car. The average for all was 1.41 inches per car. On 100 of these cars, 31 per cent had one inch free slack, 17 per cent had $1\frac{1}{4}$ inches; 11 per cent, $1\frac{1}{2}$ inches. Only 25 per cent were less than one inch. On a few cars, the free slack at one end was $\frac{3}{4}$ of an inch and on the other end 2 inches. This was all free, unresisted slack. The total slack by bunching and stretching the train ranged from $2\frac{1}{4}$ inches to $6\frac{7}{8}$ inches per car, and the average for all was 4.9 inches. It was noticeable that those trains having the greatest number of head end cars, such as baggage, express and mail cars, always developed the most slack.

In view of the fact that neither the A. R. A. nor any railroad of which we know, has any rule or specified procedure for checking up and limiting the amount of free slack in draft rigging, it is obvious that this situation justifies serious consideration leading to definite corrective action. The $5\frac{1}{8}$ -in. limit between the knuckle and guard arm of the coupler head represents a 7/16-in. allowance from the 4 11/16-in. dimension given for the standard No. 10 coupler contour. This A. R. A. limit has been specified only to insure that

couplers will remain coupled and has no direct relation to the question of free slack.

It has been argued that a certain amount of free slack is necessary to facilitate the starting of long trains, but certainly no one can take the position that as much free slack is necessary as represented by the foregoing figures; otherwise, those trains cited which have a minimum of slack are inadequately provided with free slack for suitable starting and certainly that contention has never been heard.

It is generally accepted that a friction draft gear of suitable design is much better protection against shocks than the older spring type gear; but, leaving out of consideration friction draft gears having a relatively low value when in perfect condition, many so-called friction draft gears are, on account of extended wear and lack of maintenance, offering but little, if any, better protection to the car than the ordinary spring gear. Others, because of being in a jammed condition, do not provide the protection that is characteristic of friction gears when properly maintained.

Of course, a large majority of the shocks experienced by the freight car occur during switching movements, and in these the amount of free slack is probably not of any consequence. The basic value of new gear and condition of the draft gear, however, is decidedly of consequence.

In very recent years the railroads have been realizing beneficial returns in many ways from their improved maintenance of air brake devices. The condition of train slack, as briefly reported, indicates the necessity for a similar orderly, systematic and vigilant campaign of maintenance of draft rigging.

Recommendation

The condition of the draft gear and attachments on cars on repair tracks is generally an unknown quantity; better stated, just how bad the condition may be is unknown, for these parts get little if any attention.

It is recommended that this matter be referred to the A. R. A. with the suggestion that suitable rules for interchange be adopted which will define permissible limits of wear in draft gear and couplers and provide suitable periodic test specifications to insure the maintenance of these devices within these limits, and thereby secure a reasonable control of free slack between cars.

The report was signed by F. C. O'Neill, (Big Four); R. M. Long, (P. & L. E.); W. F. Peck, (B. & O.); R. Wolfe, (N.Y.C.); W. M. Nelson, (B. R. & P.); and R. I. Cunningham, (Westinghouse Air Brake Co.)

Yard Compressed Air Plants

A paper on Yard Compressed Air Plants was presented by the St. Louis Air Brake Club, of which the following is a summary.

Today, it is common practice to haul freight trains of 100 or more cars and train movements are on record involving as high as 250 cars. Trains of these lengths vary from 4,300 ft. to something over 11,000 ft. Naturally, this development has created real problems for the air brake officers and a considerable strain on the charging and testing facilities of the yard compressed air plants. In addition, the increased cylinder and reservoir volume required for the heavy passenger trains used today has placed a greater load on yard air facilities than ever occurred with the older types of equipment.

Improvements and extensions in the facilities provided for supplying compressed air to the yard have not kept pace with the developments in railroad rolling

stock. A study of the plant installations in various yards throughout the country has revealed a more or less lack of uniformity in standards as well as in the arrangements and installation of compressor units, reservoirs and compressed air distributing systems. In general, yard air plants have failed to keep pace with other improvements, with the result that many of the older yards are not now in a position to render efficient service. Bad order tracks, rip tracks, car marking and special repair tracks should be provided with adequate facilities for train charging, car cleaning and washing, and for the operation of pneumatic tools and other devices of a similar nature.

The remaining part of this paper was devoted to discussions of the size and location of compressors, air cooling and moisture eliminating systems, the size and location of air storage reservoirs, piping and distributing systems, and the design of various detail parts of yard plant equipment. The committee favored central air compressing plants, where electric power is available, with individual units having automatic control so that units could be cut in or out according to the demand.

Other papers and reports presented during the convention were: Tiple Valve Union Gaskets—Rubber v. Leather, by the Northwest Air Brake Club; Report of Committee on Main Reservoirs; Maintenance of Steam-Driven Air Compressors, by the Southeast Air Brake Club; Report of Committee on Material for Air Brake and Air Signal Piping; Welding Locomotive Air Piping by the Oxy-Acetylene Process, by the Northwest Air Brake Club; Report of Committee on Exclusion of Dirt and Moisture from Passenger Brake Cylinders; Report of Committee on Recommended Practice, and Power Brakes for Automobiles, by H. B. Hukill.

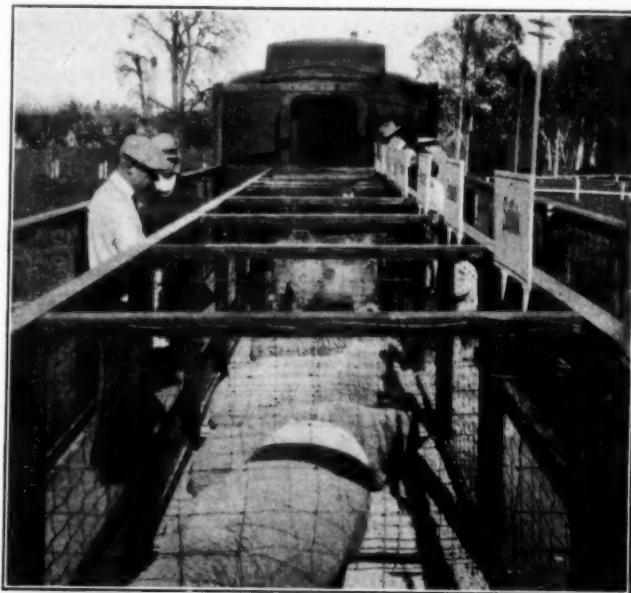
Southern Pacific Agricultural Train

THE Southern Pacific, in conjunction with the agricultural extension service of the University of California, recently operated a 15-car agricultural promotion train in which a well equipped farm kitchen was featured. The train was operated for the purpose of discussing the subject of retaining present markets, developing new ones and the advantages of diversified farming. It was especially equipped for stock displays and demonstration purposes and during the two weeks tour made stops at 24 centrally located towns and cities of the San Joaquin and Sacramento Valleys.

Morning and afternoon programs were held at each stop. Half of the day was devoted to demonstrations, lectures and discussions at the train where live stock and exhibits of particular interest to the valley farmers were on display. During the other half of the day lectures and discussions were held on the general and local economic conditions affecting agriculture. The program at the train opened with short talks by members of the university staff, who have specialized in the study of farm problems, and representatives of the Southern Pacific. Following this, demonstrations were given on the subjects of poultry, swine, dairying, sheep and kitchen management. At least 40 min. was allotted to the inspection of the train and its exhibit. Flat cars equipped with pens were used for displaying the live stock and poultry.

Two cars were expressly devoted to the interests of farm women. One car contained an ideal kitchen fully equipped with labor-saving devices. The other car was arranged for talks by the members of the home eco-

nomics staff of the university. A part of the exhibits were presented for the interest of the farm boys and girls. For this purpose, three boys who were members of the Junior Farm Bureau traveled with the train. A Pacific Fruit Express car was included in the train to show the type of equipment used in transporting perishables to eastern markets and to demonstrate how break-

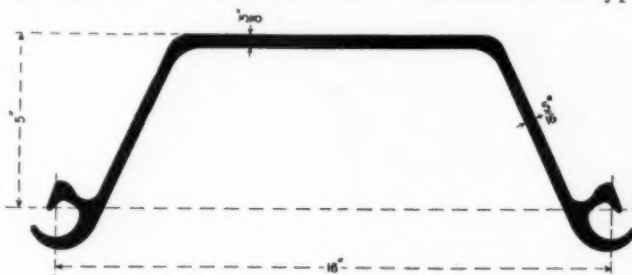


Sheep Were Displayed on a Special Car

age and damage can be prevented by proper loading and bracing. The heavier live stock was carried in automobile cars and was displayed in pens on flat cars in order to permit close inspection by visitors. A model chicken house was displayed at the end of a flat car devoted to chickens. A special pen for housing swine was exhibited on a flat car given over to swine display.

New Sheet Piling Section

THE Bethlehem Steel Company, Bethlehem, Pa., has added a deep arch type section to its line of Lackawanna steel sheet piling. This new section is designated as section No. DP165 and it is characterized by the depth and shape of its arch construction. The interlock in the new section is of the double-lock type,



The New Bethlehem Deep Arch Steel Sheet Piling Section.

similar to that employed in present sections of Lackawanna piling. The chief characteristics of the new section are: Normal width, 16 in.; web, $\frac{3}{8}$ in. thick; weight, 31.3 lb. per foot of pile; and 25 lb. per square foot of wall. The section modulus per foot of wall, single, is 10.07, and interlocked, 16.14. The new section is adapted particularly for general use in types of construction where strength and light weight are of importance, and where the piling is to be used permanently, as in the case of bulkheads, piers, retaining walls and similar structures.

Results of Using Copper Bearing Steel in Freight Cars *

Experience with this material over a period of 18 years indicates possibility of increasing car body life from one-third to one-half

By Dr. J. S. Unger

Manager, Central Research Bureau, Carnegie Steel Company, Pittsburgh, Pa.

ABOUT 20 years ago a few investigators observed that certain steel sheets, which were made by the same process, showed considerable differences in resistance to atmospheric corrosion. The ordinary chemical analyses regularly made for the four common elements, carbon, manganese, phosphorus and sulphur, showed little difference in their composition. On making more complete analysis, determining the presence of other than the usual elements, it was found that small amounts of copper were present in those sheets which were corroded the least.

Such findings were amplified by making steel sheets by the same method, but adding small amounts of copper to certain ingots of the same heat, then rolling into sheets, afterwards exposing both kinds of unprotected sheets to the atmosphere and noting the relative difference in corrosion.

Up to this time there had been a metallurgical tradition to the effect that steel containing copper was red-short and of poor quality. This tradition had been believed by many metallurgists, who had prepared specifications in which the steel was rejected if it contained above a certain low percentage of copper. When copper was added to steel, it appeared to be a display of metallurgical ignorance to deliberately add a supposedly injurious element.

This same belief was not alone true of copper, but similar experiences have been met with in the traditions regarding other elements, notably phosphorus and sulphur. It has been estimated that the loss from rusting amounts to \$300,000,000 annually in the United States. The railroads, being large users of steel, share a considerable part of this loss. Among the items affecting their losses from rust, the steel freight car is one of the most important.

The life of the steel freight car is dependent upon several factors, among which are mechanical abrasion and corrosion. The character of the loads carried governs the destruction of the car body by mechanical abrasion, and may also affect the corrosion to some extent. Regardless of the loads carried, the cars are subjected to atmospheric corrosion which, in conjunction with mechanical abrasion, will finally cause the destruction of the car body. Very little can be done to reduce the mechanical abrasion. Consequently, efforts to increase the life of the car body must be confined to reducing the losses due to corrosion.

As a result of the experiences with small amounts of copper in roofing sheets, the Bessemer & Lake Erie, early in 1914 decided to try copper bearing steel in the bodies of some of its steel freight cars to determine the effect on the life of the car. As no two cars are used under exactly the same condition of service, and

the life of the individual car is largely dependent upon the service to which it has been subjected, it is necessary when comparing different kinds of steel to make the trial in the same car. In order to make this test comparative and of sufficient magnitude to give definite information, the Bessemer & Lake Erie ordered 100 hoppers and 100 gondolas to be built, using copper bearing steel in one half of the body and plain steel in the other half of the same car.

Both the hoppers and gondolas were of 100,000 lb. capacity. The side and end plates in both kinds of cars were $\frac{1}{4}$ in. thick. The floor plates in the gondolas, and the floor in the hopper and hood cover plates in the hoppers were $\frac{5}{16}$ in. thick. The center-sill cover plates in the gondolas, and the drop-door cover plates in both kinds of cars were $\frac{3}{8}$ in. thick. It will be noted that some of these plates were thicker than ordinarily used, but as both kinds of steel were of the same thickness, the test was truly comparative.

Record of the Service Obtained

The cars were placed in service during October, 1914, and to date have been in service for about $13\frac{1}{2}$ years. All the cars are still in service with the exception of a few that are laid up for repairs.

The condition of these cars has been carefully observed by both the Bessemer & Lake Erie and the Carnegie Steel Company during the period they have been in use. It has been difficult to make an inspection of a great many of the cars at any one time, due to the fact that the cars are widely distributed over the Bessemer & Lake Erie and also on connecting lines.

The first inspection was made after the cars had been in service about two years. This inspection showed the characteristic differences between the copper bearing and the plain open hearth steel that are usually found when comparative atmospheric corrosion tests are made of the two kinds of steel under the same conditions. The unpainted surfaces of the plain steel were of a light, yellowish brown color, with loosely adhering rust. The copper bearing steel was of a dark, reddish brown color, with a dense, tightly adhering coating of rust. The plain steel was pitted to greater extent, and the pitting was much deeper than on the copper bearing steel. The most noticeable difference in the two kinds of steel at the end of two years service was the condition of the paint. The paint was adhering much better to the copper bearing steel than it was to the plain steel in similar locations in the same car. The difference in the adherence of the paint was borne out by all subsequent annual inspections of the cars. After the cars had been in service sufficiently long, it was an easy matter for anyone not familiar with these cars to decide which was copper bearing

* Abstract of a paper presented before the Railway Club of Pittsburgh, April 26, 1928.

steel and which was plain steel, simply by the condition of the coating of paint. In many cases the copper bearing steel would be well protected by the paint, while practically no paint remained on the plain steel in similar locations. This resulted in the plain steel being corroded to a greater extent on the outside of the car body than the copper bearing steel, as indicated by considerably more and deeper pitting on the plain steel.

The influence of the two kinds of steel on the adherence of the paint has also been a factor in the cost

Table I
Comparisons of Thickness after Six Years' Service

| | Copper-bearing steel | | | Plain O. H. steel | | |
|---------------|----------------------------|-----------------------|--------------------|----------------------------|-----------------------|--------------------|
| | Original thickness, inches | after 6 years, inches | Percentage of loss | Original thickness, inches | after 6 years, inches | Percentage of loss |
| Gondola 14105 | | | | | | |
| Floor plate | .313 | .287 | 8 | .313 | .256 | 18 |
| Side plate | .250 | .237 | 6 | .250 | .220 | 12 |
| Gondola 14124 | | | | | | |
| Floor plate | .313 | .285 | 9 | .313 | .250 | 20 |
| Side plate | .250 | .240 | 4 | .250 | .225 | 10 |
| Gondola 14190 | | | | | | |
| Floor plate | .313 | .270 | 13 | .313 | .230 | 26 |
| Side plate | .250 | .240 | 4 | .250 | .225 | 10 |
| Hopper 41035 | | | | | | |
| Divide sheet | .250 | .220 | 12 | .250 | .170 | 32 |

Average loss of copper-bearing steel, 8 per cent; average loss plain O. H. steel, 18 per cent.

of maintenance. In many cases cars had to be repainted simply because of the failure of the paint coating on the plain steel portion, while all the cars had to be repainted more frequently than would have been necessary if the bodies had been built entirely of copper bearing steel.

After the cars had been in service for six years, measurements were made of the thickness of the plates in similar locations in four separate cars. Table I gives the results of the measurements. It will be noted the average results at this time showed that the copper bearing steel had lost 8 per cent of its original thickness, while the plain steel in similar locations had lost 18 per cent of its thickness.

Measurements taken at subsequent inspections showed that in every case the plain steel was considerably thinner than the copper bearing steel. Where abrasion has been a more important factor than corrosion, as in the side hopper sheets, the relative difference in the loss in thickness has not been as great as when the comparison is made between the two steels in a location where there has not been as much abrasion, as in the side sheets of the gondolas. In the latter case corrosion has been more of a factor

Table II
Comparison of Thickness of Outside Hopper Sheets After 13 Years' Service

| | Original thickness, Oct., 1914, inches | Copper-bearing steel thickness, Oct., 1927, inches | Plain open-hearth steel thickness, Oct., 1927, inches |
|-------------------|--|--|---|
| | .313 | .180 | .165 |
| | .313 | .200 | .140 |
| | .313 | .215 | .100 |
| | .313 | .220 | .115 |
| | .313 | .205 | .160 |
| | .313 | .220 | .175 |
| | .313 | .232 | .107 |
| | .313 | .230 | .135 |
| | .313 | .220 | .130 |
| | .313 | .220 | .110 |
| Average thickness | .313 | .214 | .134 |
| Loss in thickness | | .099 | .179 |
| Per cent loss | | 32 | 57 |

and the copper bearing steel shows a greater superiority than it does in the side hopper sheets of the hoppers.

This is shown in Table II, which gives the average thickness of the two kinds of steel in similar locations in the same cars after 13 years service.

Again using the loss in thickness for plain open

hearth steel as 100 per cent, the copper bearing steel lost 55 per cent as much metal as the plain steel.

The results with the two kinds of steel in the hoppers were further confirmed by work done by the Bessemer & Lake Erie. Hopper 41071 was returned to the shops after 13 years' service for general repairs, which included replacement of a number of the plain steel sheets. While it was not necessary to remove the copper bearing steel in similar locations at this time, the Bessemer & Lake Erie officers removed the cross hood and diaphragm, inside hopper sheets, outside hopper sheets, center floor plates, intermediate side sheets and the side floor sheets of both kinds of steel. These sheets were then carefully cleaned and weighed to determine the loss in weight. Table III gives the relative loss of weight for the two kinds of steel in similar locations in the same car.

Table III
Comparison Copper-Bearing and Plain Open-Hearth Steel Removed From Body of a Steel Hopper Car After 13 Years' Service

| | | Original weight, Oct., 1914, lb. | Weight after 13 yrs., lb. | Loss in weight | |
|----------------------------|----------------|----------------------------------|---------------------------|----------------|----------|
| | | | | Lb. | Per cent |
| Cross hood and diaphragm | { Plain steel | 796.6 | 422.5 | 374.1 | 46.9 |
| | { Copper steel | 796.6 | 506.5 | 290.1 | 36.4 |
| Inside hopper sheets..... | { Plain steel | 256.9 | 139.5 | 117.4 | 45.7 |
| | { Copper steel | 256.9 | 161.5 | 95.4 | 37.1 |
| Outside hopper sheets.... | { Plain steel | 324.8 | 163.0 | 161.8 | 49.8 |
| | { Copper steel | 324.8 | 231.5 | 93.3 | 28.7 |
| Center floor sheet..... | { Plain steel | 144.7 | 80.5 | 54.2 | 44.4 |
| | { Copper steel | 144.7 | 108.0 | 36.7 | 25.4 |
| Intermediate side sheet... | { Plain steel | 516.8 | 263.5 | 253.3 | 49.1 |
| | { Copper steel | 516.8 | 468.5 | 48.3 | 9.3 |
| Side floor sheets..... | { Plain steel | 1330.9 | 795.5 | 535.4 | 40.2 |
| | { Copper steel | 1330.9 | 973.5 | 357.4 | 26.8 |
| Total | { Plain steel | 3370.6 | 1864.5 | 1506.1 | 44.7 |
| Total | { Copper steel | 3370.6 | 2449.5 | 921.1 | 27.3 |

It will be noted that the loss in weight for the copper-bearing steel was 61 per cent as much as the plain steel. This is in fairly close agreement with the relation found when the losses were determined by measuring the thickness of the side hopper sheets as shown on Table II.

Most of the hoppers have now been in service long enough to require general body repairs. These repairs are in places where the mechanical abrasion and corrosion have been most severe. In cases where the repairs have consisted of patches put on over the original steel, as on the bottom of the side hopper sheets, the patches in many cases have been put on over both kinds of steel. Examination of the edges of the steel sheets under such patches show that the plain steel has been worn to a ragged knife-like edge, while the copper steel in the same location would be 1/8 inch or over in thickness. This indicated that while it was necessary to patch the plain steel, the copper bearing steel would have lasted much longer, but the shops considered it cheaper to make repairs to both kinds of steel at one shopping of the car.

This has not been the case where the cars were given extensive repairs. During the last inspection one gondola car was examined in the shops in which the plain steel end had been replaced, while no replacement was necessary in the copper bearing steel. Hopper 41080 was also in the shops at this time. The men in the shops were not familiar with the fact that different kinds of steel had been used in this car, but had replaced such parts as in their judgment required replacement. The plain steel end sheet, floor sheet, and outside hopper sheets had been replaced by new sheets. The copper bearing sheets in the same location were considered sufficiently good for further service and were not replaced. Another hopper was also inspected in one of the yards, which had been repaired

some time previously. This car also had new end and floor sheets put in the plain steel half, while the original copper bearing sheets were still in use.

A pronounced difference is noticeable in the cars, aside from the question of the paint previously noted. The copper bearing sheets are comparatively straight and free from serious bulges, dents, or bends. The plain open hearth steel sheets are dented and bent out of shape to a much greater extent, indicating that they have become thinner in gage. In a number of the cars it is possible to determine which is the plain and which is the copper bearing steel by this difference in appearance. In addition to the differences noted one gondola was inspected in which the plain steel floor plates were worn and rusted completely through at several locations, while the copper bearing floor plates were still in good condition. One hopper was inspected in which the plain steel side sheets had rusted through in two different locations. The copper bearing steel side sheets in this car were comparatively straight and gave no evidence of failure in the near future.

The plates and structural shapes used in the bodies of these cars amounted to about five tons in the gondolas and six tons in the hoppers. Since it is the body of the car that fails first, and ordinarily measures the life of the car, if copper bearing steel were used exclusively in the body, the average life would be increased from one-third to one-half, or in round numbers, from five to eight years. This additional life more than justifies the slight extra cost per ton for the copper bearing steel.

Our experience and observation of these cars may be summarized as follows:

- 1.—Paint adheres very much better to copper bearing steel in a car body than it does to plain open hearth steel.
- 2.—The saving in repainting cars, due to better adherence of paint to copper bearing steel, would be sufficient to justify the use of copper bearing steel in the bodies of steel freight cars.
- 3.—Where mechanical abrasion has not been a serious factor, as in the side sheets of gondolas, the loss in thickness for the copper bearing steel was only one-third as great as for the plain open hearth steel.
- 4.—Where the steel was subjected to severe mechanical abrasion as well as corrosion, the loss in thickness for the copper bearing steel was approximately 60 per cent as great as for the plain open hearth steel.
- 5.—From the results of this investigation it can be conservatively stated that the use of all copper bearing steel in the body of the cars would increase the life of the car body from $33\frac{1}{3}$ to 50 per cent.

* * *



Railroad Station at Gdynia, Poland's New Seaport

Looking Backward

Fifty Years Ago

The fight between the Atchison, Topeka & Santa Fe and the Denver & Rio Grande for control of the right-of-way south of Trinidad, Colo., continues active. West of Pueblo, Colo., the Denver & Rio Grande for control of the right-of-way south of 25 it obtained a temporary injunction restraining the Santa Fe from grading its line through the Grand Canyon of the Arkansas, but the injunction was dissolved the next day and work resumed. As a measure of retaliation the Santa Fe has ordered a survey of a line from Pueblo to Denver with a view to building a branch of its own parallel to the Denver & Rio Grande. The Santa Fe is now considered to be a formidable rival of the Texas & Pacific enterprise which is temporarily resting at Fort Worth, Tex., awaiting the slow and uncertain action of congress.—*Railroad Gazette*, May 3, 1878.

The certificate of incorporation of the New York, Lake Erie & Western (being the reorganization of the Erie) was filed in the office of the secretary of state of New York on April 27. The benefits of the organization are open to all parties interested in the property, and nearly all the bondholders have already united, as well as the majority of the stockholders. The stockholders have yet six months to come in, the terms being the payment of four per cent in money on preferred stock and six per cent on common.—*Chicago Railway Review*, the issue of May 4, 1878.

The cutting of passenger rates between Cincinnati and Eastern cities ended April 29 in a restoration to the schedule rates by all the lines. This was timely, as a longer continuance of the contest bids fair to involve Chicago and St. Louis in the same difficulties.—*Chicago Railway Review*, May 4, 1878.

Twenty-Five Years Ago

The Pere Marquette has let a contract for the construction of a 20-mile line from Alfred, Mich., to Porter, Ind., which will provide it with an entrance into Chicago. Actual entrance into the Grand Central station will be effected through trackage rights from Porter over the Lake Shore & Michigan Southern [now part of the New York Central] and the Chicago Terminal Transfer [now the Baltimore & Ohio Chicago Terminal].—*Railroad Gazette*, May 8, 1903.

On April 23 the Interstate Commerce Commission declared the recent increase of freight rates on grain and grain products on railroads east of Chicago to be unjust and unlawful, and a demand was made for a readjustment of the rate before May 15, under penalty of further proceedings. The Commission said that grain rates had not been reduced during the time of depression and for that reason the railroads are not justified in advancing these rates at this time.—*Railway and Engineering Review*, May 2, 1903.

Ten Years Ago

The director-general announced on May 2 that orders had been placed for the construction of 70,000 standard steel under-frame freight cars in addition to the orders already given for the building of 30,000 cars. The 100,000 cars will include 25,000 40-ton double-sheathed box cars, 25,000 50-ton single-sheathed box cars, 20,000 50-ton composite gondola coal cars, 5,000 70-ton low-side gondola cars and 25,000 55-ton hopper coal cars. These orders involve an aggregate cost of nearly \$300,000,000.—*Railway Review*, May 4, 1918.

James C. Davis, general attorney for the Chicago & North Western for Iowa, has been appointed general solicitor, with headquarters at Chicago.—*Railway Review*, the issue of May 4, 1918.

Communications and Books

Are Railroads too Conservative Regarding Electrification?

EXETER, N. H.

TO THE EDITOR:

Your editorial on page 612 of the issue of March 17, entitled "Steam Operation through Long Tunnels," speaking of the Moffat tunnel, reads, "It is possible also that electrification may be justified eventually on the ground of increased track capacity and greater economy of operation over the 40 miles of the two per cent approach grade from the east, rather than by reason of unsatisfactory ventilation." Why do you insert the word "possible?" Is there any electrification in the country which is not justified by both of the grounds mentioned?

Why, to carry this business a little further, is it that the railroads have been so slow about electrification? That electrification is more practical than steam operation has been proved again and again both in theory and in practice. It is good to be conservative, but it seems to me that the railroads are carrying it a little too far. Visions of stream-lined electric locomotives hauling trains over concrete roadbeds at 200 m. p. h. may be classed as dreams, but, if the railroads are to meet the competition of the airways, what else are they to do? If these dreams don't become facts before long, the railroads will be junked, as the cartoon in your Odds and Ends Department of March 17 depicts.

HERBERT E. BIXLER.

What Color Passenger Car Exteriors?

NEW YORK.

TO THE EDITOR:

Tucked away obscurely in a recent issue of *Railway Age* I read with dismay the news that a well-known western road, long favorably known for the brilliant appearance of its passenger equipment, proposes to abandon bright colors and lose its distinctiveness by standardizing on what is flatteringly known as "green."

Is this step not reaction in a most disturbing form? Nowadays we hear and see more and more of color—bright color—everywhere. Automobiles, the competitors of the railroads, not only appear in the most striking colors, but are also brought up to a finish never even dreamed of by railroads for their passenger equipment?

Would anyone like to be seen by any of his friends driving in public in an automobile with an exterior as dull in color, as lacking in finish and as carelessly cleaned as passenger trains are? Does the public, as it is sometimes alleged, really prefer to "ride on rubber," or is its apparent preference really that for an attractive, clean vehicle for one which is almost without color and without artistic design (as far as exteriors are concerned)?

It is said that brilliantly colored cars are "harder to keep clean" than dull colored ones. But is this true? Is not the real truth simply that brilliant colors show slovenliness where it exists, while the current so-called green, being the same color as dust combined with grease, tends to conceal it?

One now hears of color in kitchens, in bathroom fixtures, in office furniture, in skyscraper exteriors. Do not the railroads need more of it rather than less? With the great volume of interchange of cars among railroads in this country, particularly Pullman cars, it probably is not desirable for all railroads to work up individual color schemes for themselves. Should not all of them, however, standardize on a more attractive color than that they now use—varying from it individually as advisable? Let the roads which use distinctive colors keep them; and let the others which use a standard color get together and change the standard from the unattractive green now used to something really beautiful, such as a grass green, for instance.

Can the railroads expect to succeed in selling luxurious travel when they wrap up, as it were, their worthy commodity in

packages of dust mixed with grease (or, if not actual dust and grease, at least a color which resembles it so closely that few can distinguish between them)?

BARTON C. FOLKSWAIN.

"Government Subsidizing of Competition with Railways."

AMARILLO, TEX.

TO THE EDITOR:

The editorial in your issue of April 14, "Government Subsidizing of Competition with Railways," is a clear-cut analysis of the proposition of government in business supported by taxation.

The press announces that Kansas City will build docks and again inaugurate navigation on the Missouri river between Kansas City and St. Louis. It is suggested a short history of this ridiculous failure a few years ago and proper criticism will be appropriate now.

The six railroads now serving these two cities have a capacity to handle more than double the peak load ever offered them, and the cost of bank protection, dredging channel or any plan is only a waste of tax-payers' money, at best providing a waterway only in flood time for three months in a year.

A commission to determine the sanity of the promoters is in order.

AVERY TURNER.

* * *

KANSAS CITY, MO.

TO THE EDITOR:

I was so much interested in your editorial entitled "Government Subsidizing of Competition with the Railways," that I read it four times, and you have certainly made a most convincing and clear case against this subsidizing.

If this should come about, and the government spend billions (which it would have to do to make the waterways efficient) what assurance has anyone they will be used to any great extent? The Erie Canal is an ideal waterway, with practically no current to buck, as in rivers, and rates are lower to the shippers, but it is paralleled by several roads and does not carry enough tonnage to pay upkeep, if same had to be paid by the users of this waterway.

As you are probably aware, there is a big "holler" out here to make the Missouri river navigable at government cost. Now, I know this stream, and for about six months in the year it is either covered with ice or so low that one can spit across it. I have seen it in August when it carried less than a foot of water in the main channel, and they talk about spending millions on it, when I venture to say it is not usable for more than six months in the year.

Another thing: Suppose a buyer here orders a carload of material from Cleveland via Nickel Plate and Missouri river at St. Louis. It gets to St. Louis, has to be switched to the wharf, unloaded, loaded in a barge, towed to Kansas City, unloaded on the wharf, and the consignee has to send drays to lead it, take it to his warehouse, unload it on the dock and then place it in stock. The firm I have in mind is a big one, and has a switch right into its warehouse. Cars received today are set tonight at its dock, unloaded tomorrow, with a minimum of handling, one in loading and one in unloading. Unless the rate makes it profitable to do this, in spite of the possible damage in so many handlings, this receiver is going to use all-rail, and don't you forget it.

Another thing is the time element. All-rail, Cleveland to Kansas City, is about 72 hours. Via water from St. Louis the receivers would be lucky in getting it in eight days, or five days' difference.

Now, in this day of rapid turnover of merchandise and low inventories it costs interest money to some one who has the money invested in this particular commodity. I under-

stand the flour millers say the interest charge on a car of flour is 50 cents a day, so you can see how eager the seller is to get his money, and let the buyer carry the interest load. This is not much thought about, but you well know that some one has a money investment in every commodity, such as iron, from the time it is dug from the ground until the article made therefrom is in the hands of the ultimate consumer, and while this money is invested the interest charge goes on.

In the matter of safety, as in passenger traffic, trains are surrounded by all safeguards possible, so there will be no injury to anyone, and it is continually pounded into every one connected with train service that "safety first" means just that, while passenger buses, carrying 20 or 30 people, going at from 30 to 40 miles per hour on a narrow slab road, are not safeguarded in any manner whatsoever. Enginemen have to serve a long time before they are given the throttle, but any 20-year old boy that can run an auto is hired to handle these heavy buses with only his judgment as to what is and is not safe. It is to laugh!

And again: Trains run, come snow, come blow, if it's humanly possible to get them through, yet right here in Missouri we had floods last year, and the buses were out of business from three to four days. Now, if this bus competition puts the railroads out of business from a passenger standpoint, when bad weather comes, there will be no transportation whatever. Think it over. People do not, I am sure.

I am disgusted with the amount of loose thinking there is going on in our country about transportation matters.

C. C. BRANHAM.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Adoption of Automatic Couplers on Japanese Railways. Prefaced by a brief history of couplers in Japan this illustrated pamphlet contains a detailed account of the change of couplers on Government and private railways in Japan, including organization for change, number of locomotives and cars affected, costs, and results of change. Diagrams and pictures supplement text. 21 p. 22 figures. Published by the Ministry of Railways, Tokyo, Japan. Apply.

Graphic Presentation of Rate Exhibits and Evidence, by R. D. Rynder. Fundamental considerations, planning of exhibits, types of evidence to present, and kinds of charts discussed. 80 p. Pub. by LaSalle Extension University, Chicago, Ill. \$1.00.

Graphic Sketches from the History of the Baltimore and Ohio Railroad, Vol. I, by Paul Winchester. "These sketches . . . are largely personal reminiscences, based on manuscript notes and newspaper stories, written by the author . . . as the events occurred from the beginning of the great war between the states in 1861" . . . Baltimore, Md., The Maryland County Press Syndicate.

Two Essays in Early Locomotive History, by C. F. Dendy Marshall. Essay I is entitled, "The First Hundred Railway Engines" and includes a chapter on the first attempts in America. Essay 2 is entitled "British Locomotives in North America." The work is indexed by designers and constructors, engines, railways, and "miscellaneous." Illustrated. 120 p. Pub. by the Locomotive Publishing Co., Ltd., London, England.

Periodical Articles

Railroad Valuation with Special Reference to the O'Fallon Decision, by James C. Bonbright. Discusses two important issues—the question of depreciation and the controversy over kind of cost to be used. Supplement to the American Economic Review for March, 1928, p. 181-205.

John Stevens and His Sons, by A. D. Turnbull. An illustrated account of the contributions to steamboat and rail transportation made by John, Edwin and Robert Stevens in the early days of the American republic. They engaged themselves in doing "the things that couldn't be done." Mechanical Engineering, May, 1928, p. 353-357.

Odds and Ends

C. A. Shomo, machinist at the Clifton Forge shops of the Chesapeake & Ohio, owns a monkey wrench, for which he claims 33 years' seniority. He has used it continuously during all of that time. This, Shomo believes, is the oldest wrench in point of seniority in railway service.

A practical miniature locomotive, 6 in. long, but exactly like the standard engines of the state railroad, has been built by a French mechanic, M. Melcher. He has built the engine to a scale of 1/80 of normal. It weighs 12 oz. and is made to run. Much of the work had to be done under a magnifying glass. He worked evenings on it for 10 years. The boiler tubes are hardly larger than coarse hairs.

The Champion Dinner Pail Carrier

Channel swimmers, coffee drinkers, hog callers, Charleston dancers, and what not, can retire back stage for the time being. We wish to announce Irving E. Weller, a freight house employee of the New York, New Haven & Hartford, world's champion dinner pail carrier. Mr. Weller has carried the same tin dinner pail, a hand-made affair, for 30 years. According to reports, it is fully 1½ ft. long by about 10 in. wide, and he has never had any difficulty in keeping it filled during that period of time.

A Prophecy

In 1832, the editor of the Sentinel of Troy, N. Y., delivered himself of the following oracular statement:

"We repeat our conviction that, save in peculiar situations, railroads will be entirely dispensed with in a very few years. Good macadam roads will supersede them, and on such roads we shall have locomotives, with their trains of cars, traversing the country at an average speed of at least 12 miles the hour."

A Peculiar Name and More

About the Suitcase of Money

"In your issue of April 14," writes E. H. Wilde, general passenger agent of the Great Northern, "I notice the name of History Harrison given as the most peculiar in the railway service. King Solomon Jones, who died some years ago, was for a long time a janitor in the general office building of the Great Northern Railway at St. Paul. Even at this late date it would appear that he is entitled to recognition."

"In the same issue you mention Jack Kearn's departure from Shelby, Mont., after the Dempsey-Gibbons fight. The statement is not quite correct. He hired a special train from Shelby to Great Falls consisting of an engine and coach for which he paid the regular tariff charge of 125 one-way fares, or \$448.75. The amount of money carried by him on this trip was not given to the writer, but it completely filled two ordinary size suitcases."

Railroad Men Acclaimed for Work with Boys

At the recent annual meeting of the Boy Scouts of America held in San Francisco, two men connected with the railroad industry were signally honored. Clarence H. Howard, president of the Commonwealth Steel Company, who started his career as a locomotive fireman and has been closely connected with railroading ever since, was inducted into the order of the Silver Buffalo. This is the highest honor that is bestowed for outstanding achievement in boy welfare work and but five of these are awarded annually. The recipient is entitled to wear a small silver buffalo attached to a red, white, and blue ribbon suspended about his neck.

The second railroad man to be honored was William S. Wollner of the Northwestern Pacific who was presented with the fifteen-year service pin which is the highest award for service in the Boy Scouts. Mr. Wollner has actually been actively engaged in Boy Scout work during all of the past eighteen years.

NEWS of the WEEK



Gilt Edge Express on N. Y., N. H. & H., at Delmar, N. J.

THE COMMITTEE of the Association of Railway Executives of which W. B. Storey (A. T. & S. F.) is chairman, appointed to investigate the advisability of buying up the American Railway Express Company, held a meeting in New York on April 30, but reports no action. The committee held long conferences with a committee of railroad counsel, headed by Robert J. Cary (N. Y. C.). Whether the railroads shall buy the shares of the express company outright, or shall avail themselves of the privilege, under their contracts, of buying the express company's physical property, remains undecided.

March Net of Class I Railroads

Net railway operating income for Class I railroads in March was \$90,774,159, at an annual rate of 4.66 per cent. on investment as compared with \$94,602,038 in March last year.

Canadian Mechanics Have Vacation With Pay

The Shopmen's Federation, No. 11, organization of the shop craftsmen employed by the Canadian National, at a meeting in Winnipeg on April 21, announced that the management of the road has agreed that all these employees who have been in the service of the company in Canada for two years or more, shall be granted one week's holiday, annually, with pay. It is said that about 16,000 employees will enjoy the benefit of this decision. The management of the road announces that this action has been taken as an appreciation of the efforts of the employees to make successful the co-operative plan under which they are now working.

Increase in Cars Needing Repair

Freight cars in need of repair on April 1 totaled 139,698 or 6.2 per cent of the number on line, according to reports filed by the carriers with the Car Service Division of the American Railway Association. This was an increase of 727 cars above the number reported on March 15, at which time there were 138,971 or 6.2 per cent.

Freight cars in need of heavy repairs on April 1 totaled 100,700 or 4.5 per cent, an increase of 2,003 compared with March

15, while freight cars in need of light repairs totaled 38,998 or 1.7 per cent, a decrease of 1,276 compared with March 15.

Gallatin Gateway Ball

A free trip through Yellowstone National park was presented by H. A. Scandrett, president of the Chicago, Milwaukee, St. Paul & Pacific, to the wife of a mechanic, of Bensenville, Ill., who was the holder of the lucky number in a drawing at the second annual Gallatin gateway ball of the Chicago chapter of the Milwaukee Railroad Women's club, held at Chicago on April 27, with an attendance of 2,000 persons. The membership of the clubs, which were started two years ago all over the system, now totals 10,000 made up of women employees of the road or wives of employees. There are 50 chapters of the club. The proceeds of this dance will go into a fund to assist needy employees.

Locomotives in Need of Repair

Locomotives in need of repair on the Class I railroads of this country on April 1 totaled 8,287 or 13.8 per cent of the number on line, according to reports filed by the carriers with the Car Service Division of the American Railway Association. This was a decrease of 1,007 locomotives compared with the number in need of such repairs on March 15, at which time there were 9,294 or 15.4 per cent. Locomotives in need of classified repairs on April 1 totaled 4,696 or 7.8 per cent, a decrease of 454 compared with March 15, while 3,591 or 6.0 per cent were in need of running repairs, a decrease of 553 compared with the number in need of such repairs on March 15.

Class I railroads on April 1 had 7,276 serviceable locomotives in storage compared with 6,955 on March 15.

Emergency Board Created Under Labor Act

President Coolidge on April 28 issued a proclamation creating a board of five members to investigate a dispute between the Kansas City, Mexico & Orient and certain of its train service employees and report their findings to him within thirty days. This is the first example of the creation of such a board under the pro-

vision for "emergency boards" in the railway labor act of 1927. The action was taken by the President on notification by the Board of Mediation that the dispute has not been adjusted under the provisions of the act and "now threatens substantially to interrupt interstate commerce." The members of the board are to be compensated at the rate of \$100 a day for every day actually employed with or upon and on account of travel and duties incident to such board.

Safety Section at Buffalo, May 15-17

The Safety Section of the American Railway Association, L. F. Shedd, chairman, is to hold its eighth annual meeting at the Hotel Statler, Buffalo, N. Y., on Tuesday, Wednesday and Thursday, May 15, 16 and 17. The principal speakers are the following:

Tuesday Morning
Charles E. Hill, (N. Y. C.); L. G. Bentley, (C. & O.); T. H. Carrow, (Penn.).

Tuesday Afternoon
Robert H. Ford, (Rock Island); H. A. Rowe, (D. L. & W.); Thomas C. Cashen, (Switchmen's Union of N. A.); H. H. Larson, (U. P.); C. T. Bailey, (O. S. L.); F. Hartenstein, (L. V.).

Wednesday Morning
L. B. Allen, (C. & O.); R. Rowland, (D. L. & W.); J. J. Desmond, (I. C.); W. A. Booth, (C. N. R.); H. E. Warner, (N. Y. C.).

Wednesday Afternoon
R. H. Ashton, (Pres. A. R. A.); G. H. Warfel, (U. P.); J. G. Fitzhugh, (G. C. & S. F.); M. A. Hollingsworth, (C. & N. W.); C. M. Kimball, (Southern); C. B. Carroll, (M-K-T); W. R. Petty, (M. P.); M. P. Grady, (Penn.).

Thursday Morning
J. M. Barker, (L. V.).
The election of officers will take place on Wednesday afternoon.

Locomotives Installed

Class I railroads in the first three months this year installed 465 locomotives, according to reports filed by the carriers with the Car Service Division of the American Railway Association. Compared with the corresponding period last year, this was an increase of 18 locomotives but a decrease of 105 compared with the corresponding period in 1926. For the month of March alone, the railroads placed in service 140 locomotives compared with 142 in March the year before.

Locomotives on order on April 1 this year totaled 137 compared with 244 on the same date last year. Freight cars in-

stalled in service in the first three months in 1928 totaled 10,064 compared with 15,796 for the same period in 1927 and 21,363 for the same period in 1926. Freight cars installed in March this year totaled 4,032 compared with 5,175 in March, 1927.

The railroads on April 1 had 25,248 freight cars on order compared with 27,255 on the same date last year and 49,524 on the same date in 1926. These figures as to freight cars and locomotives include new and leased equipment.

Canadian Highway Crossing Fund

The fund administered by the Board of Railway Commissioners of Canada for use in abolishing highway grade crossings, now has available the sum of \$2,631,645; and Charles A. Dunning, minister of railways and canals, has laid before the House of Commons a proposal to modify the restrictions embodied in the law creating this fund, under which various proposed improvements have been unable to derive benefit from the fund. The operation of the fund is limited by statute to the end of the year 1929. At present, the fund is not applicable to a crossing of more than four tracks nor to any crossing which has been created since 1909.

Waterway Hearings Concluded

Hearings before the House committee on interstate and foreign commerce on the Denison bill to increase the capitalization of the Inland Waterways Corporation were concluded on May 2 after Commissioner Eastman, of the Interstate Commerce Commission, had presented a statement reviewing the action of the commission on matters relating to joint arrangements between the barge line and the rail carriers. He said he had not had an opportunity to ascertain the views of the other commissioners relating to the bill and proposed amendments and discussed his personal views. He expressed the opinion that under the proposed amendment making it mandatory on the commission to prescribe joint traffic arrangements between any water carrier on the inland waterways and the railroads in the event of failure of the carriers to agree within a given time, without a hearing, the commission could not issue an order that would stand in court and that the present law, which authorizes the commission to prescribe joint arrangements if it deems them in the public interest, after hearing, is adequate except for the question as to whether the commission can handle the cases with sufficient expedition.

Wage Statistics for January

The number of employees required by Class I railways as of the middle of the month of January was 1,614,208, according to the Interstate Commerce Commission's monthly statement of railway wage statistics. Their total compensation for the month was \$230,972,228. Compared with the returns for the corresponding month of last year, the number of employees reported for January, 1928, shows a decrease of 109,963, or 6.38 per cent. The

number of employees in the train and engine service group shows the most substantial decrease, the report says, being 8.5 per cent. The number in the maintenance of equipment group shows a decrease of 8.1 per cent. The total compensation decreased 5.56 per cent.

As an aftermath of the decision of the Interstate Commerce Commission denying the application of the Piedmont & Northern for authority to build extensions of its electric railway system in North and South Carolina, paralleling the Southern, Representative Abernethy, of North Carolina, promptly introduced in the House a bill, H. R. 13,113, to amend the interstate commerce act to eliminate the requirement of certificates of public convenience and necessity in respect of construction of new lines of railroad or extensions of existing lines.

Pennsylvania Abolishes Richmond Division

The Richmond division of the Pennsylvania, embracing the lines between Richmond, Ind., and Adams and between Rendecombe Junction, Ohio, and Anoka, Ind., was abolished on May 1 and the lines transferred to the Cincinnati division. The Richmond terminal has been attached to the Columbus division. The superintendent of the Richmond division, G. R. Barry, and his staff will be transferred to other parts of the Pennsylvania System.

Incident to the abolition of the Richmond division, and also effective on May 1, that portion of the Western region between Trinway, Ohio, and Morrow, now operated as the Zanesville branch of the Cincinnati division, has been transferred to the Central region, to be operated as the Zanesville branch of the Panhandle division. Operation of the portion of the Ohio River & Western (3-ft. gage) between Woodsfield, Ohio, and Lawton, 67 miles, has been abandoned and the line between Zanesville and Lawton, nine miles, will be operated as a part of the Zanesville branch of the Panhandle division.

Northern Pacific Co-operates With Country Schools

The Northern Pacific has instituted a plan of co-operation with educational interests in outlying territory and the industrial and civic agencies in metropolitan centers along its lines, which provides for a service of educational excursions, designed to supplement school work in the smaller communities with actual contact by the students and teachers with the diversified activities of the cities. Of the first two of these educational excursions one was conducted to St. Paul, Minn., and the other to Minneapolis, Minn.

Schools were suspended on Friday and special trains were made available to leave at convenient times to bring the school students and their teachers into the cities early in the day. Fares were made low and included municipal transportation and luncheon. In St. Paul the excursionists were taken to the state capital, various industrial plants, and points

of scenic interest. In Minneapolis, the itinerary of the excursionists included trips to the flour mills and other industrial plants, a tour of the chamber of commerce and a drive over a scenic boulevard. The railroad has undertaken to make these week-end tours harmonize closely with the work of the children and teachers in the schools.

Tariffs Filed by Carrier Assumed To Be Approved

A suit by the Cleveland, Cincinnati, Chicago & St. Louis against the Agar Manufacturing Corporation, for sums due on a car service contract, was decided recently by the Supreme Court of Ohio in favor of the railroad, as against a claim by the defendant that the suit had no standing in court because the claim was based on rates which appear only in an extra-legal tariff and which therefore were not legal rates. It was held that, the tariffs having been filed and the Interstate Commerce Commission having retained them without raising any question, they were to be regarded as operative, and having the same force and effect as if they had been filed in pursuance of a prior direct order from the commission.

The Agar concern supplies tank cars, on which the railroad pays rent, and the suit was brought to recover for certain empty mileage during the 12 months ending with June 30, 1921. Defendant claimed that the Interstate Commerce Commission had given no formal approval of the tariff containing the schedule of charges for excess empty mileage and therefore that these schedules had no statutory force. The railroad has made payments to the car company under the mileage requirements of the tariff.

N. Y. C. Telegraphers Granted Six-Day Week

By the decision of a board of arbitrators just reported and to go into effect on May 16, telegraphers on the New York Central, the Cleveland, Cincinnati, Chicago & St. Louis and other controlled lines, are to work six days a week, the arbitration providing for the establishment, by agreement, of systematic rules for relief operators. To afford opportunities for adjustment in the case of employees who have been working seven days a week, an advance in pay equivalent to 3.3 cents an hour is granted. On the Michigan Central, the same increase is granted provided the employees and the management agree on a relief day program, this agreement apparently having been not effected as yet.

The total number of men affected is about 4,800, of whom about 3,000 have been working seven days a week.

The arbitrators were: for the railroad company, John G. Walber, vice president; Daniel W. Dinan, general manager of the lines east; for the telegraphers, Senator G. D. Robertson, Ottawa, Ontario, and George Lavengood, chairman of a telegraphers' brotherhood on the C. C. C. & St. L.; neutral members: Chancellor Charles W. Flint of Syracuse

University and Dean M. E. Cooley of the University of Michigan.

The telegraphers of the different roads had requested increases of 15 cents an hour (and more on some of the smaller roads). A relief man regularly assigned for less than four days a week will be considered as an extra man. The rules regulating pay, where an operator works irregularly or reports and is not required to serve, are modified. The provisions of the award are continued in force for one year, and thereafter will be subject to 30 days' notice by either party.

It will be seen that a telegrapher who has been working seven days weekly and earning say, five dollars on the seventh day, will receive, in place of the five dollars relinquished, about \$1.58.

Southwestern Railroads Organize Train Service Board

Thirteen railroads in the Mississippi Valley have formed the Southwestern Regional Train Service Board of Adjustment, with headquarters at St. Louis, Mo., which will serve as a board of adjustment for the settlement of all disputes growing out of grievances preferred by members of the four train service brotherhoods.

All matters to be considered by the board, which also include the interpretation or application of agreements concerning rates of pay, rules or working conditions, must first be handled in the usual manner by each individual carrier, being referred by either the railroad or the employees to the board after the chief operating officer of the carrier has failed to effect a settlement. The agreement under which the board of adjustment was created specifically states that all disputes with respect to changes in rates of pay, rules or working conditions, disciplinary cases and all other disputes not involving the interpretation or application of agreements are excluded from its jurisdiction.

The board will be composed of eight members, four of whom will represent the employee unions and four who will jointly represent the railroads. Of the four railroad representatives two will act as permanent members, devoting their entire time to the functions of the board. It is expected that the first hearings will be held early in May.

The managerial members are: Col. J. H. Elliott, former general manager of the Texas & Pacific and later a member of the United States Railroad Labor Board, and D. H. Bremerman, assistant to the vice-president in charge of operation of the Chicago, Burlington & Quincy, Chicago, permanent members; E. C. Wills, assistant general manager of the Missouri Pacific; and J. G. Torian, assistant to the vice-president and general manager of the Southern Pacific Lines in Texas and Louisiana. The organization members are: R. E. Edrington, assistant grand chief of the Brotherhood of Locomotive Engineers; S. A. Boone, vice-president of the Brotherhood of Locomotive Firemen and Enginemen; F. H. Nemitz, vice-president of the Order of Railway Conductors; and George W. Anderson, vice-

president of the Brotherhood of Railroad Trainmen. The railroads which are a party to the agreement are: the Missouri Pacific, including the International-Great Northern; the Missouri-Kansas-Texas; the Texas & Pacific; the St. Louis-San Francisco; the Southern Pacific Lines in Texas and Louisiana; the Louisiana & Arkansas; the Louisiana Railway & Navigation Company; the Trinity & Brazos Valley; the Galveston, Houston & Henderson; the Kansas, Oklahoma & Gulf; the Midland Valley; the Waco, Beaumont, Trinity & Sabine, and the Wabash.

Addition to Uniform Accounting Rules

The Interstate Commerce Commission, Division 4, has issued an order to the effect that there shall be added to the Special Instructions in the Classification of Operating Expenses, Issue of 1914, the following instruction:

"23. There shall not be included in these accounts rents paid for property (used in transportation service) which has been listed in the basic valuation inventory as carrier property used but not owned. The rents for such property (otherwise chargeable to these accounts) shall be charged to account 543, 'Miscellaneous Rents.'"

This has been made effective as of January 1, 1928, as has the following order in the matter of establishing the requirement that expenditures by steam roads for additions and betterments up to a certain maximum shall be charged to operating expenses being under consideration:

It is ordered, That the following instructions are hereby prescribed as the second paragraph of section 2, of the general instructions on page 9 of the Classification of Investment in Road and Equipment of Steam Roads, Issue of 1914:

(a) When the property change involves: (1) the acquisition of property (other than land, a section of track, or a unit of equipment) the cost of which is less than \$100; (2) The betterment of property (see paragraph 10 of section 2 of the general instructions in the Classification of Investment in Road and Equipment), the excess cost of which is less than \$100; or (3) The retirement of property (other than land, a section of track, or a unit of equipment) the ledger value of which is less than \$100, the cost of the property acquired or the value of the salvage from the property retired shall be appropriately included in operating expenses, and no adjustment shall be made in the property investment account.

(b) The carrier shall not parcel expenditures or retirements under a general plan for the purpose of bringing the accounting therefor within this rule, neither shall it combine unrelated items of property for the purpose of excluding the accounting therefor from the rule.

(c) This exception to the general instructions of this classification shall not apply to property changes involving the retirement and replacement of property when either the ledger value of the property retired or the cost of the property acquired is \$100 or more. The accounting for such changes shall be in accordance with section 7 of these instructions.

(d) The carrier is permitted to adopt for the purpose of its accounting a limit of less than the aforesaid amounts provided it first files with the Commission the maximum amount which it proposes to adopt and makes no subsequent change in this amount except by authority of the Commission.

It is further ordered, That the last sentence in the ninth paragraph of section 2, and the third paragraph of section 7 of the general instructions of the Classification of Investment in Road and Equipment of Steam Roads, Issue of 1914, be rescinded.

Canadian Roads' Net Higher In March

Increases in gross and net earnings for the month of March and for the first quarter of the present year are shown in the summary of earnings and expenses issued by the Canadian National. Coincident with these increases there is a decrease in the operating ratio.

For the month of March last the gross earnings amounted to \$21,157,650, which compares with \$20,267,106 for March, 1927, an increase of \$890,543, equivalent to 4.39 per cent in favor of March of the current year. During the month the working expenses amounted to \$16,422,877.66, while in March, 1927, these expenses totaled \$15,981,200, an increase of \$441,677.28, or 2.76 per cent for March last.

The net earnings in March, 1928, amounted to \$4,734,772, while in March, 1927, the net amounted to \$4,285,906, an increase in favor of the month of March past of \$448,866, or 10.47 per cent. The operating ratio in March last was 77.62 per cent, while in March, 1927, it was 78.85 per cent.

Net profits of the Canadian Pacific Railway for March showed a gain of \$649,011 over the same month last year, and an increase of \$1,651,672 for the first three months of this year as compared with the same period last year.

Gross earnings for March amounted to \$16,807,501, as compared with \$15,433,137 in March of last year, an increase of \$1,374,363. Working expenses were higher by \$725,351, leaving net profits up \$649,011 over March of last year.

Gross earnings for the three-month period showed an increase of \$3,864,778 over the same period of 1927, while working expenses increased by \$2,213,106. First quarter's gross was best on record.

The following table shows the earnings, expenses and net profits for the month with comparisons:

| | 1928 | 1927 | Inc. |
|-------------|--------------|--------------|-------------|
| Gross | \$16,807,501 | \$15,433,137 | \$1,374,363 |
| Exp. | 13,174,294 | 12,448,942 | 725,351 |
| Net | \$3,633,206 | \$2,984,194 | \$649,011 |

Gross revenue on the Quebec Central Railway for the calendar year 1927 was \$3,312,279, as compared with \$3,205,142 in 1926 and \$2,947,315 in 1925. Operating expenses were higher, however, with the result that operating income was slightly lower, standing at \$679,239, as compared with \$720,137 in the preceding year. Other income amounted to \$4,048, making total income of \$683,287. Deductions of interest charges, etc., at \$404,692, dividends at \$169,080, and equipment trust instalments at \$100,000 left a surplus for the year of \$9,515. Previous balance was brought forward at \$104,180, making a profit and loss balance in the current report of \$113,695.

Income account figures for the past two years compare as follows:

| | 1927 | 1926 |
|-------------------------|-------------|-------------|
| Gross revenue..... | \$3,312,279 | \$3,205,142 |
| Operating expenses..... | 2,633,040 | 2,485,005 |
| Operating income..... | \$ 679,239 | \$ 720,137 |
| Other income..... | 4,048 | 10,260 |
| Total income..... | \$ 683,287 | \$ 730,397 |
| Charges | 404,692 | 385,958 |
| Balance | \$ 278,595 | \$ 344,439 |
| Dividends | 169,080 | 169,080 |
| Balance | \$ 109,515 | \$ 175,359 |
| Equip., Trust..... | 100,000 | 100,000 |
| Balance | \$ 9,515 | \$ 75,359 |
| † Appropriations ..... | ..... | 75,000 |
| Balance | \$ 9,515 | \$ 359 |
| Previous balance..... | 104,180 | 103,820 |
| L. & L. balance..... | \$ 113,695 | \$ 104,179 |

† For betterment and improvement to property.

Meetings and Conventions

The following list gives names of secretaries, date of next or regular meetings and places of meetings.

- AIR BRAKE ASSOCIATION.**—T. L. Burton, 165 Broadway, New York City. Exhibit by Air Brake Appliance Association.
- AIR BRAKE APPLIANCE ASSOCIATION.**—Charles R. Busch, Buffalo Brake Beam Co., 32 Nassau St., New York. Meets with Air Brake Association.
- AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.**—J. D. Gowin, 112 W. Adams St., Chicago.
- AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.**—E. L. Durcan, 332 S. Michigan Ave., Chicago.
- AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.**—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.
- AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.**—J. Rothschild, Room 400, Union Station, St. Louis, Mo. Annual convention, June 12-15, 1928, Memphis, Tenn.
- AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.**—L. M. Jones, Supt. of Sleeping and Dining Cars, C. M. & St. P., Chicago. Annual meeting, October, 1928, Havana, Cuba.
- AMERICAN ELECTRIC RAILWAY ASSOCIATION.**—J. W. Welsh, 292 Madison Ave., New York. Annual convention, Sept. 22-28, Cleveland Public Auditorium, Cleveland, Ohio.
- AMERICAN RAILROAD MASTER TINNERS' COPPER-SMITH'S AND PIPE FITTERS' ASSOCIATION.**—C. Borchardt, 202 North Hamlin Ave., Chicago.
- AMERICAN RAILWAY ASSOCIATION.**—H. J. Forster 30 Vesey St., New York, N. Y. Division I.—Operating.—J. C. Caviston, 30 Vesey St., New York. Freight Station Section (including former activities of American Association of Freight Agents).—R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago. Next meeting, June 19-22, Niagara Falls, N. Y. Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York. Protective Section (including former activities of the American Railway Chief Special Agents and Chiefs of Police Association).—J. C. Caviston, 30 Vesey St., New York. Next meeting, June 19-21, Hotel Statler, St. Louis. Safety Section.—J. C. Caviston, 30 Vesey St., New York. Annual meeting, May 15-17, 1928, Hotel Statler, Buffalo, N. Y. Telegraph and Telephone Section (including former activities of the Association of Railroad Telegraph Superintendents).—W. A. Fairbanks, 30 Vesey St., New York. Next meeting, Sept. 18-20, 1928, San Francisco. Division II.—Transportation (including former activities of the Association of Transportation and Car Accounting Officers).—G. W. Covert, 431 South Dearborn St., Chicago. Division III.—Traffic, J. Gottschalk, 143 Liberty St., New York. Division IV.—Engineering, E. H. Fritch, 431 South Dearborn St., Chicago, Ill. Annual convention, March 5-7, 1929, Chicago. Exhibit by National Railway Appliances Association. Construction and Maintenance Section.—E. H. Fritch. Electrical Section.—E. H. Fritch. Signal Section (including former activities of the Railway Signal Association).—H. S. Balliet, 30 Vesey St., New York. Division V.—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Annual convention, June 20-27, 1928, Atlantic City, N. J. Exhibit by Railway Supply Manufacturers' Association. Equipment Painting Section (including former activities of the Master Car and Locomotive Painters' Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago. Next meeting, Sept. 11-13, Windsor Hotel, Montreal. Division VI.—Purchase and Stores (including former activities of the Railway Storekeepers' Association).—W. J. Farrell, 30 Vesey St., New York, N. Y. Annual meeting, June 20-22, Atlantic City, N. J. Division VII.—Freight Claims (including former activities of the Freight Claims Association).—Lewis Pilcher, 431 South Dearborn St., Chicago, Ill. Annual meeting, June 5-8, 1928, Book-Cadillac Hotel, Detroit, Mich. Car Service Division.—C. A. Buch, 17th and H Sts., N. W., Washington, D. C. Motor Transport Division.—George M. Campbell, American Railway Association, 30 Vesey St., N. Y. C. Next meeting, June 21-23, Rose Room, Hotel Traymore, Atlantic City, N. J.
- AMERICAN RAILROAD BRIDGE AND BUILDING ASSOCIATION.**—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Annual convention, Oct. 23-25, 1928, Statler Hotel, Boston. Exhibit by Bridge and Building Supply Men's Association.
- AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.**—R. G. East, Agricultural Agent, Pennsylvania Railroad, Shelbyville, Ind. Annual convention, May 9-11, 1928, Hotel Columbus, Miami, Fla.
- AMERICAN RAILWAY ENGINEERING ASSOCIATION.**—(Works in co-operation with the American Railway Association, Division IV).—E. H. Fritch, 431 South Dearborn St., Chicago. Annual convention, March 5-7, 1929, Chicago. Exhibit by National Railway Appliances Association.
- AMERICAN RAILWAY MAGAZINE EDITORS' ASSOCIATION.**—Miss Lucille Fishburn, Room 930 La Salle Street Station, Chicago. Annual meeting May 10-11, 1928, Columbia, Mo.
- AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.**—G. G. Macina, C. M. & St. P. Ry., 11402 Calumet Ave., Chicago. Annual convention, August 29-31, 1928, Hotel Sherman, Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.—Secretary: E. H. Lund, Federal Machinery Sales Co., Chicago.
- AMERICAN SHORT LINE RAILROAD ASSOCIATION.**—T. F. Whittelsey, 1319-21 F St., N. W., Washington, D. C. Annual meeting, May 10, Mexico City.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.**—Calvin W. Rice, 29 W. 39th St., New York. Railroad Division, Marion B. Richardson, Associate Mechanical Editor, *Railway Age*, 30 Church St., New York. Spring meeting, May 14-17, William Penn Hotel, Pittsburgh, Pa.
- AMERICAN WOOD PRESERVERS' ASSOCIATION.**—E. J. Stocking, 111 West Washington St., Chicago.
- ASSOCIATION OF RAILWAY CLAIM AGENTS.**—H. D. Morris, District Claim Agent, Northern Pacific Ry., St. Paul, Minn. Next meeting, June 20-22, 1928, Omaha, Neb.
- ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.**—Jos. A. Andreucetti, C. & N. W., Room 413, C. & N. W. Station, Chicago. Semi-annual meeting, June 21, Atlantic City, N. J. Annual convention, Oct. 23-26, Hotel Sherman, Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.
- ASSOCIATION OF RAILWAY EXECUTIVES.**—Stanley J. Strong, 17th and H Sts., N. W., Washington, D. C.
- ASSOCIATION OF RAILWAY SUPPLY MEN.**—C. F. Weil, American Brake Shoe & Fdy. Co., 332 So. Michigan Ave., Chicago. Meets with International Railway General Foremen's Association.
- BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.**—W. D. Waugh, Detroit Graphite Co., St. Louis, Mo. Annual exhibit at convention of American Railway Bridge and Building Association.
- CANADIAN RAILWAY CLUB.**—C. R. Crook, 129 Chaffon St., Montreal, Que.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.**—Aron Kline, 626 North Pine Ave., Chicago. Regular meetings, 2nd Monday in month, except June, July and August, Great Northern Hotel, Chicago.
- CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.**—J. W. Krause, 514 East Eighth St., Los Angeles, Calif. Regular meetings, second Friday of each month, 514 East Eighth St., Los Angeles.
- CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.**—A. J. Walsh, 5874 Plymouth, Apt. 18, St. Louis, Mo. Meetings, first Tuesday of each month, except July and August, Broadview Hotel, East St. Louis, Ill.
- CENTRAL RAILWAY CLUB.**—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 2nd Thursday each month, except June, July, August, Hotel Statler, Buffalo, N. Y.
- CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.**—(See Railway Car Department Officers' Association.)
- CINCINNATI RAILWAY CLUB.**—D. R. Boyd, 811 Union Central Bldg., Cincinnati, Ohio. Meetings, 2nd Tuesday in February, May, September and November.
- CLEVELAND RAILWAY CLUB.**—F. L. Frericks, 14416 Alder Ave., Cleveland, Ohio. Meetings, first Monday each month, except July, August, September, Hotel Hollenden, Cleveland.
- INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.**—W. J. Mayer, Michigan Central R. R. Detroit, Mich. Annual convention, August 21-22, 1928, Hotel Sherman, Chicago. Exhibit by International Railroad Master Blacksmiths' Supply Men's Association.
- INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.**—W. W. Criley, Ajax Mfg. Co., Cleveland, O.
- INTERNATIONAL RAILWAY FUEL ASSOCIATION.**—L. G. Plant, 80 E. Jackson Blvd., Chicago. Annual convention, May 7-11, 1928, Hotel Sherman, Chicago. Exhibit by International Railway Supply Men's Association.
- INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.**—Wm. Hall, 1061 W. Wabash Ave., Winona, Minn. Annual convention, September 18-21, 1928, Chicago.
- INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.**—W. J. Dickinson, 189 W. Madison St., Chicago. Meets with International Railway Fuel Association.
- MASTER BOILER MAKERS' ASSOCIATION.**—Harry D. Vought, 26 Cortlandt St., New York. Annual meeting, May 22-25, 1928, Cleveland.
- NATIONAL ASSOCIATION OF RAILROAD TIE PRODUCERS.**—E. A. Morse, vice-president, Potomac Tie & Lumber Co., St. Louis, Mo.
- NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.**—James B. Walker, 270 Madison Ave., New York. Annual convention, September, 1928, Glacier National Park, Mont.
- NATIONAL RAILWAY APPLIANCES ASSOCIATION.**—C. W. Kelly, 1014 South Michigan Ave., Chicago. Exhibit at A. R. E. A. convention.
- NATIONAL SAFETY COUNCIL.**—Steam Railroad Section: C. F. Larson, Supt. of safety, Missouri Pacific, St. Louis, Mo. Annual congress, Oct. 1, New York.
- NEW ENGLAND RAILROAD CLUB.**—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings 2nd Tuesday in month, excepting June, July, August and September, Copley Plaza Hotel, Boston, Mass.
- NEW YORK RAILROAD CLUB.**—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 3rd Friday in month, except June, July and August.
- PACIFIC RAILWAY CLUB.**—W. S. Wollner, 64 Pine St., San Francisco, Cal. Regular meetings 2nd Thursday in month, alternately in San Francisco and Oakland.
- RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.**—E. R. Woodson, 1116 Woodward Building, Washington, D. C. Next convention, May 1-4, 1928, Atlanta-Biltmore Hotel, Atlanta, Ga.
- RAILWAY BUSINESS ASSOCIATION.**—Frank W. Noxon, 1406 Packard Bldg., Philadelphia, Pa. Annual meeting, November, 1928, Hotel Commodore, New York.
- RAILWAY CAR DEPARTMENT OFFICERS' ASSOCIATION.**—A. S. Sternberg, Belt Ry. of Chicago, Polk and Dearborn Sts., Chicago. Supply Men's Association.—R. S. Johnson, W. H. Miner, Inc., 209 S. LaSalle St., Chicago.
- RAILWAY CLUB OF PITTSBURGH.**—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.
- RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.**—Edward Wray, 9 S. Clinton St., Chicago. Meets with Association of Railway Electrical Engineers.
- RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.**—F. W. Venton, Crane Co., 836 S. Michigan Ave., Chicago. Meets with Traveling Engineers' Association.
- RAILWAY FIRE PROTECTION ASSOCIATION.**—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md. Next convention, Oct. 9-11, 1928.
- RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.**—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division and Purchases and Stores Division, American Railway Association, June 20-27.
- RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.**—G. A. Nelson, 30 Church St., New York. Meets with Telegraph and Telephone Section of A. R. A., Division I.
- RAILWAY TREASURY OFFICERS' ASSOCIATION.**—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 11-13, Atlanta-Biltmore Hotel, Atlanta, Ga.
- ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.**—T. F. Donahue, Gen. Supt. Road, Baltimore & Ohio, Pittsburgh, Pa. Annual convention, September 18-20, 1928, Book-Cadillac Hotel, Detroit, Mich. Exhibit by Track Supply Association.
- ST. LOUIS RAILWAY CLUB.**—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2nd Friday in month, except June, July and August.
- SIGNAL APPLIANCE ASSOCIATION.**—F. W. Edmunds, West Nyack (Rockland Co.), N. Y. Meets with A. R. A., Signal Section.
- SOUTHEASTERN CARMEN'S INTERCHANGE ASSOCIATION.**—Clyde Kimball, Inman Shops, Atlanta, Ga. Meets semi-annually.
- SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.**—A. T. Miller, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3rd Thursday in January, March, May, July, September and November, Ansley Hotel, Atlanta.
- SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.**—R. G. Parks, A. B. & A. Ry., Atlanta, Ga.
- TRACK SUPPLY ASSOCIATION.**—A. H. Todd, Positive Rail Anchor Co., 80 E. Jackson Blvd., Chicago. Meets with Roadmasters' and Maintenance of Way Association.
- TRAVELING ENGINEERS' ASSOCIATION.**—W. O. Thompson, Gen. Supt. R. S., New York Central, Buffalo, N. Y. Annual convention, September 25-28, 1928, Hotel Sherman, Chicago. Exhibit by Railway Equipment Manufacturers' Association.
- WESTERN RAILWAY CLUB.**—W. J. Dickinson, 189 West Madison St., Chicago. Regular meetings, 3rd Monday each month, except June, July and August.

Traffic

The Northern Pacific has re-established its tourist sleeping-car service to the Pacific Coast. The service was discontinued during the winter.

At the thirteenth annual meeting of the Traffic Club of Denver on April 20 W. E. Burr of the Daniels & Fisher Company was elected president, F. H. Herzberger was elected vice-president and Charles J. Hotchkiss, secretary-treasurer.

A "live stock special" is to be run by the Atlantic Coast Line over its lines in South Carolina, during the month of June, carrying state officers, college specialists and others to educate the farmers in the management of dairying, poultry and hogs. Stops will be made at 49 towns.

The Canadian Pacific has issued a 28-page folder and relief map entitled "Resorts in the Canadian Pacific Rockies." The relief map shows the relative location of lakes, mountains and rivers and gives the height of some of the more prominent peaks.

The Chicago, Milwaukee, St. Paul & Pacific has shortened the schedule of its day express between Chicago and Minneapolis, 1 hr. 30 min., thereby affording a schedule of 11 hr. 10 min., to Minneapolis, and of 10 hr. and 30 min., to St. Paul. Southbound the time will be reduced 45 minutes.

The Southern Pacific, effective May 6, will shorten the running time of its Cascade (Train No. 17) between Portland, Ore., and San Francisco, Cal., 1 hr. 15 min., or to 22 hours. The train will leave Portland at 10:15 p. m. and arrive in San Francisco at 8:15. Returning No. 18 will leave San Francisco at 6:20 p. m. instead of 4:40 p. m. The schedules of the Shasta, Nos. 11 and 12, will be cut 15 minutes. A coach special which has been operated three days a week at a reduced fare between these points, has proved so popular that, effective May 6, this train will be operated daily.

Five special trains designated as the Red, White, Blue, Green and Orange specials left Chicago over the Pennsylvania on April 28, carrying 1,000 members of the Medinah temple of the Mystic Shrine to the meeting of the Imperial Council at Miami, Fla., on May 1 to 3. The trains were taken by the Pennsylvania to Louisville, Ky., by the Southern to Jacksonville, Fla., and by the Florida East Coast to Miami, where they arrived on April 30. Following the meeting the delegation will spend two days in Havana, Cuba, and will return over the Florida East Coast to Jacksonville, the Atlantic Coast Line to Albany, Ga., the Central of Georgia to Birmingham, Ala., and the Illinois Central to Chicago.

The Interstate Commerce Commission has instituted an investigation of the rates on hay in the western district by

combining several formal complaint cases involving hay rates with an investigation on petition of certain western carriers as Part 10 of the Rate Structure investigation, No. 17,000, under the Hoch-Smith resolution. It is the intention of the commission to deal comprehensively with the whole system of hay rates in the western group with a view to bringing about a more harmonious adjustment. The proceedings are assigned for hearing before Commissioner Taylor and Examiners Worthington and Walsh on June 21 at Fort Worth, Tex., and before the examiners on July 2 at Denver, Colo.

A resolution calling on the Interstate Commerce Commission to report to the Senate regarding the relative freight rates on railroads in the United States as compared with those on Canadian railroads, particularly on grain, was adopted by the Senate on April 30. It was proposed by Senator Walsh, of Massachusetts, and was originally directed to the Department of Commerce. It asks for the rates on wheat from various points in the United States and Canada and also as to "what is the aggregate amount that would be realized annually by American shippers of (a) wheat, (b) all grains, over and above what they do realize during any 12-month period were the rates on such freight on American railroads no higher than they are on the Canadian railroads." Another question is as to the extent by which "such lesser rates on the Canadian railroads (if they are less)" are due to charter provisions of said railroads and the extent to which "such excessive rates on American railroads (if they are excessive)" are attributable to the Transportation Act of 1920.

Freight Traffic in February

The volume of freight traffic moved by the Class I railroads in February amounted to 35,700,952,000 net ton-miles, according to reports compiled by the Bureau of Railway Economics. This was a decrease of 1,557,836,000 net ton-miles or 4.2 per cent under that of February, 1927. In the Eastern district there was a decrease of 8.7 per cent, while the Southern district reported a decrease of 7.5 per cent. The Western district reported an increase of 4.2 per cent.

For the two months ending with February the total was 71,967,625,000 net ton-miles, a decrease of 4,523,679,000 net ton-miles or 5.9 per cent as compared with that of the corresponding period last year. In the Eastern district the decrease was 10.7 per cent, while the Southern district reported a decrease of 8.2 per cent. The Western district reported an increase of 2.5 per cent.

The average daily movement per freight car in February was 29.8 miles, a decrease of 0.6 below the average for the same month in 1927 but an increase of 1.2 above that for February, 1926.

The average load per car in February was 26.6 tons, a decrease of 1.4 tons under the same month last year and 0.6 ton below February, 1926.

Equipment and Supplies

Locomotives

THE CLEVELAND UNION TERMINALS COMPANY is inquiring for twenty-five 150-ton electric locomotives.

THE SOUTHERN PACIFIC has ordered 10 Mallet 2-8-8-2 type locomotives from the Baldwin Locomotive Works.

THE CANADIAN PACIFIC has ordered 4 snow plows for use on double track, and 7 snow plows for single track service, from its Angus shops.

THE GREAT NORTHERN has ordered 2 electric locomotives, to be built jointly by the Baldwin Locomotive Works and the Westinghouse Electric & Manufacturing Company.

THE CANADIAN PACIFIC has ordered 25 Mikado type locomotives from the American Locomotive Company through the Montreal Locomotive Works, Ltd. Inquiry for this equipment was reported in the *Railway Age* of April 21.

Freight Cars

THE CANADIAN PACIFIC has ordered 40 caboose cars from its Angus shops.

THE VIRGINIAN RAILWAY is inquiring for 1,000 hopper car bodies of 57½ tons' capacity.

THE CHICAGO & NORTH WESTERN has ordered 300 general service cars from the Siems-Stemle Company.

THE CHICAGO, BURLINGTON & QUINCY is rebuilding 250 ballast cars in its own shops at Galesburg, Ill.

THE KANSAS CITY MEXICO & ORIENT is reported to be inquiring for 100 box cars.

THE CHICAGO & NORTH WESTERN is inquiring for 200 flat cars of 50 tons' capacity.

THE AMTORG TRADING CORPORATION has ordered 16 flat cars of 30 tons' capacity from the Magor Car Corporation. Inquiry for this equipment was reported in the *Railway Age* of March 24.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 500 steel underframes from the Pennsylvania Car Company. Inquiry for this equipment was reported in the *Railway Age* of April 21.

THE NORTH WESTERN REFRIGERATOR LINE COMPANY has ordered 500 steel under-frame refrigerator cars 40 ft. long of 40 tons capacity, and 100 refrigerator car underframes, from the American Car & Foundry Company.

THE SOUTHERN PACIFIC ordered 175 tank cars from the General American

Tank Car Corporation, and not from the American Car & Foundry Company as was reported in the *Railway Age* of April 28.

Passenger Cars

THE CANADIAN PACIFIC has ordered 5 sleeping car frames from the Canadian Car & Foundry Company and 5 from the National Steel Car Corporation.

THE PULLMAN COMPANY has ordered 100 sleeping cars from the Pullman Car & Manufacturing Corporation.

THE PACIFIC ELECTRIC is inquiring for 10 center entrance street cars.

Signaling

THE ST. LOUIS-SAN FRANCISCO has ordered from the Union Switch & Signal Company, 70 semaphores, style S, and other material, for installation between Tulsa, Okla., and Bristow.

THE DELAWARE, LACKAWANNA & WESTERN has ordered from the Union Switch & Signal Company an electro-pneumatic interlocking for lower Hackensack River drawbridge; a model 14 machine, 27 levers; 69 electro-pneumatic switch movements and other apparatus.

THE BOSTON REVERE BEACH & LYNN has contracted with the Union Switch & Signal Company for the installation of alternating current track circuits from East Boston, Mass., to Lynn, 25 miles of track. The order includes color-light signals for a part of the distance; 105 impedance bonds, and other apparatus. There are nine highway crossings for which the ringing points are retained.

THE CITY OF BOSTON has ordered from the Union Switch & Signal Company material for an electro-pneumatic interlocking to be installed at Tower Q, Ashmont, on the Boston Elevated railroad, the construction work to be done by the railroad company. The machine will have 15 levers, with a spot-light track model. The order includes 22 color-light signals, four automatic stop layouts and other apparatus.

THE CANADIAN PACIFIC has ordered from the General Railway Signal Company, materials for a section of G-R-S dispatching system between Medicine Hat and Dunmore, B. C., including nine miles of absolute permissive block signaling and four points controlled from the control machine located in the station at Dunmore. Two of these points are ends of yards which are to be equipped with Model 5A switch machines, one a junction switch with a branch line equipped with electric lock, and one a starting signal for passenger trains at Medicine Hat. The order includes 18 Model 2A semaphore signals.

Miscellaneous

THE PENNSYLVANIA has ordered 300 car lighting generators and lamp regulators from the American Brown Boveri Electric Corporation.

Supply Trade

The Steamotor Company, Chicago, has moved its offices from 431 South Dearborn street to 105 Wacker Drive.

Will McNamee, manager of the Imperial, Pa. plant of Briggs & Turivas has also been placed in charge of Pittsburgh district sales.

Thomas S. Stephens for the past 25 years connected with machinery sales activities of Manning, Maxwell & Moore, Inc., New York, and lately as manager of railroad machinery sales, has resigned.

C. Irving Dwinell who was sales engineer for the General Electric Company at Providence, R. I., has been appointed manager of the Boston, Mass., branch at 514 Atlantic avenue, of the United States Electrical Tool Company.

F. A. Ernst, formerly representative of the American Rolling Mill Company, with headquarters at Chicago, has been appointed assistant district sales manager of the Inland Steel Company with headquarters at St. Louis, Mo.

Theodore Beran, commercial vice-president of the General Electric Company in charge of the New York district retired on May 1. Mr. Beran had been manager of the New York district since 1903, and was elected vice-president in 1926.

The Ardco Manufacturing Company, Hoboken, N. J., is the successor of the B & S Manufacturing Corporation; H. L. Wittpenn is president and Charles Stern vice-president. The company has appointed the following representatives: M. C. M. Hatch, Boston, Mass., T. Z. Railway Equipment Company, Chicago and Frank R. De Brun, San Francisco, Cal.

The Roller Bearing Company of America, Newark, N. J., has purchased the plant of the Mercer Motor Car Company, Trenton, N. J. The Roller Bearing Company will install its present equipment in that plant and add new equipment required to take care of its increasing sales. The plant acquired occupies 11½ acres and the buildings have 175,000 sq. ft. of floor space.

The McMyler-Interstate Company, Bedford, Ohio, was thrown into receivership on April 23, on a petition of the largest holder of common stock who brought friendly action to protect the company. The petition states that while the assets far exceed the liabilities, the company has \$2,000,000 in debts and some of the creditors have refused to grant extensions and the company has been unable to secure additional financing.

O. B. Capps, until recently eastern sales manager of the Locomotive Stoker Company, at New York, on May 1, formed a company known as O. B. Capps, Inc., with O. B. Capps as presi-

dent, and office at 420 Lexington avenue, New York. The new corporation expects to specialize in locomotive and car equipment sales and also will handle marine accounts. Mr. Capps will represent various manufacturers, including the Buffalo Bronze Die Cast Corporation, Buffalo, N. Y. whose product is especially adapted to locomotive brasses, tender and car brasses, etc.

Ward A. Miller, New York sales manager of the Midvale Company of Philadelphia, has been appointed a vice-president of the Vanadium Corporation of America, New York, and will have general supervision over all commercial affairs of the corporation. Mr. Miller has long been associated with the iron and steel industry. He began work in the steel business with Joseph T. Ryerson & Sons, Chicago, and was affiliated with that organization for over seven years, serving in its Chicago, New York and Pittsburgh offices, and for about three years prior to the war as manager



Ward A. Miller

at Pittsburgh. He left that company to enter the United States Army where he served during the war as a captain in the Ordinance Corps. Following the war, he became connected with the Midvale Steel & Ordnance Company, Philadelphia, as manager of the distributors division of general sales. He later served as manager of sales in charge of the Chicago district and since the dissolution of the Midvale Steel & Ordnance Company, he has been New York sales manager of the Midvale Company of Philadelphia, in charge of the district comprising New York, New England and Canada.

N. Petinot, general manager of sales at New York of the Vanadium Corporation of America, has been appointed assistant to the president and will devote his time principally to technical matters both in this country and abroad; J. A. Miller, Jr., assistant general manager of sales succeeds Mr. Petinot as general manager of sales; Gustav Laub, assistant secretary, has been appointed assistant general manager of sales; P. J. Gibbons, assistant treasurer will assume the additional duties of assistant secretary; Jerome Strauss has been engaged for special work in engineering and

metallurgical lines. Mr. Strauss was graduated from Stevens Institute of Technology with a degree of M. E. in 1913. He later served with the metallurgical department of the Illinois Steel Company, at South Chicago, and was engaged in metallurgical work in drop forging manufacture until 1917. He then joined the United States Army as first lieutenant and was detailed on general inspection work of ordinance materials. He left the army in 1919 and was made a captain of the Ordinance Reserve. The same year he went to the United States naval gun factory at Washington, D. C., where he served consecutively as assistant chief chemist and metallurgist, chief chemist and then as material engineer. He now has the rank of lieutenant commander in the United States Naval Reserve. He is an active member of many metallurgical societies in this country and is known in these circles for his publications on various metallurgical matters.

Safety Car Heating and Lighting Company

The Safety Car Heating and Lighting Company and subsidiaries for the year ended December 31, 1927, shows net earnings of \$1,005,838 after charges and taxes, equivalent to \$10.19 a share earned on 98,620 shares of stock. This compares with \$1,188,574, or \$12.05 a share in 1926. After payment of the regular dividend of 8 per cent and an extra dividend of 2 per cent, amounting to \$986,200, there was a surplus for the year 1927 of \$19,638.

The consolidated balance sheet of the Safety Car Heating and Lighting Company and subsidiaries, as of December 31, 1927, compares as follows:

| | Assets | |
|--|---------------------|---------------------|
| | 1927 | 1926 |
| Cash | \$970,801 | \$711,930 |
| Loans and notes receivable and accrued interest | 1,607,865 | 1,431,765 |
| Accounts receivable | 801,960 | 993,571 |
| Inventories | 1,765,044 | 1,710,490 |
| Investments | 1,512 | 32,512 |
| Mortgage receivable | | 200,000 |
| Real estate, machinery, etc., after depreciation and other charges | 9,505,343 | 9,819,021 |
| Prepaid expenses | 24,174 | 29,005 |
| | <u>\$14,676,699</u> | <u>\$14,928,294</u> |
| | Liabilities | |
| | 1927 | 1926 |
| Accounts payable | \$188,771 | \$210,690 |
| Reserves for taxes and contingencies | 186,622 | 232,650 |
| Capital stock | 9,862,000 | 9,862,000 |
| Surplus | 4,439,306 | 4,622,954 |
| | <u>\$14,676,699</u> | <u>\$14,928,294</u> |

Trade Publications

TITANIUM IN RAIL STEEL.—In a 26-page bulletin on the subject of ferro carbon-titanium in basic open-hearth rail steel, the Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., presents a review of this subject, dealing with the method of titanium treatment, the effect of titanium on the steel, and the wearing qualities of titanium treated rails. It also includes detailed service records of titanium treated rails, showing the effect of the treatment in minimizing the various classes of rail failures.

Construction

CANADIAN NATIONAL.—Legislation authorizing the Canadian National to increase from \$7,000,000 to \$10,500,000 the bond issue to take care of additions to proposed improvements in the Toronto terminals has been discussed in the House of Commons of Canada. The additional facilities proposed include an engine house, office building and express terminal. This company also contemplates the construction of a hotel at Halifax at an estimated cost of \$1,125,000.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has authorized the construction of a water treating plant at El Reno, Okla., with a capacity of 42,000 gal. per hour and a coaling station at Estherville, Iowa, with a capacity of 200 tons. Authorization has also been given for the construction of the second section of the new yard at Armourdale, Kan., for the construction of new tracks and the rearrangement of existing tracks at Enid, Okla., for the construction of four additional yard tracks at Joliet, Ill., and for the construction of an extension to the storage track at DePue, Ill. Plans have also been prepared for the reduction of grades on 10.8 miles of the line between Bureau, Ill., and Sheffield from a maximum of 0.6 per cent to a maximum of 0.3 per cent. Passing tracks at Washington, Iowa; Whitewater, Kan., White River and Peabody and Ponca City, Okla., will be extended. Grade separation structures are planned in conjunction with highway authorities at Christie, Iowa, on Federal Highway No. 63, at East Des Moines, Iowa, and on Federal Highway No. 65, and at Jamesport, Mo. At Roswell, Colo., it is planned to replace the overhead bridge at the crossing with the Atchison, Topeka & Santa Fe with a heavier structure.

CLEVELAND UNION TERMINALS.—Bids are being received by this company for the construction of a three-level station building and viaducts at Cleveland. Bids on the project which is estimated to cost approximately \$8,000,000 will close on May 15.

ERIE.—A contract for the construction of a bulkhead platform between Erie piers 20 and 21 in New York has been awarded to Allen N. Spooner & Son, Inc., New York. The project also involves general repairs to pier 21.

ERIE.—This road has awarded a contract to the Bates & Rogers Construction Company of Chicago, for work in connection with the elimination of a grade crossing at Chestnut street, Montclair, N. J.

GREAT NORTHERN.—A contract has been awarded to the Ogle Construction Company, Chicago, for the construction of a 500-ton electrically operated steel coaling station at Willmar, Minn.

ILLINOIS TRACTION SYSTEM (St. Louis Electric Terminal Railway).—This com-

pany has asked the Board of Aldermen of the City of St. Louis, Mo., for a 50-year franchise which will allow the construction of underground terminal facilities at Lucas avenue and High street, St. Louis, the construction of a double-track underground line between Cass street and the terminal and the construction of an elevated line from McKinley bridge to Branch street. The entire project is expected to cost about \$5,000,000. Included in the terminal plans are the construction of an eight-story office building at a cost of \$1,000,000, the construction of a freight and a passenger station and the construction of an underground yard with a capacity of 120 cars.

MISSOURI-KANSAS-TEXAS LINES.—The construction program of this system for 1928 will involve the expenditure of \$3,821,000 for improvements to the right-of-way and structures. Bank widening and roadway protection work planned for 1928 will cost \$169,000, additional ballasting will cost \$365,000 and this year's program of rail laying will cost \$654,000. The replacement of light bridge spans with heavier structures will require an expenditure of \$182,000 while the replacement of trestle bridges with permanent structures and embankments will require the expenditure of \$505,000. At Eureka (Houston), Tex., it is planned to spend \$151,000 for the construction of new yard tracks, at Parsons, Kan., a new interlocking plant will be installed at a cost of about \$21,000, at Dublin, Tex., a new brick combination freight and passenger station will be constructed at a cost of \$32,000 and a water treating plant will be constructed at Smithville, Tex., to cost \$25,000. About \$98,000 will be expended in the vicinity of Rocheport, Mo., as part of the program for the reduction of all curves on the main line to a maximum of 3 deg. while at Wilsonton, Kan., \$159,000 will be spent for the reduction of grade from a maximum of 0.7 per cent to 0.5 per cent. Various other improvements to roadway and structures of a minor nature will involve the expenditure of \$1,460,000.

RICHMOND, FREDERICKSBURG & POTOMAC.—This company contemplates the construction of a bridge on its line over Powell's Creek, south of Washington, D. C.

ST LOUIS-SAN FRANCISCO.—A contract has been awarded to the J. W. Gerhardt Construction Company, St. Louis, Mo., for the construction of a combined freight and passenger station at Poplar Bluff, Mo., and a freight station at Pittsburg, Kan. Each of the buildings will be constructed of brick, with stucco exterior finish, will have outside dimensions of about 30 ft. by 100 ft. and will each cost approximately \$25,000.

SEABOARD AIR LINE.—This railroad has awarded a contract to Sutton Brothers of Jacksonville, Fla., for grading and track laying for icing facilities at Aberdeen, N. C. A contract has also been awarded to C. V. York, Raleigh, N. C., for a brick veneered passenger station at Palmetto-Ellenton, Fla.

Financial

ATLANTA & ST. ANDREWS BAY.—Authorized to Renew Notes.—The Interstate Commerce Commission has authorized this company to renew from time to time \$27,864 of 5 per cent promissory notes.

BOSTON & ALBANY.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue \$5,700,000 of 4½ per cent improvement bonds to be delivered to the New York Central on account of capital expenditures.

CANADIAN NATIONAL. — Equipment Financing.—A statement regarding the extent to which equipment trust financing is done in the United States and what is done on the Canadian National was made before the special House Committee on National Railways and Shipping at Ottawa last week by R. A. C. Henry, of the bureau of economics of that road. It was in part as follows:

"In Canada and the United States it has been the practice for many years to issue Equipment Trust Securities for the purpose of securing funds to purchase a large proportion of the rolling stock used in railway operation.

"There are several types of equipment trusts, but the most widely used is based upon what is known as the 'Philadelphia Plan.' Under this plan there are three parties involved, a railway company, a rolling stock company, and a trustee. The railway company agrees to lease the equipment from the rolling stock company and to pay in the form of rental an amount equal to the interest upon the securities to be issued and sufficient to retire the serial payments on account of principal annually or semi-annually, as the case may be, until all the securities have been paid off. The rolling stock company pledges the lease with the trustee, who, in turn, issues equipment trust notes to the public. The railway company does not obtain title to the equipment until the equipment trust notes have been fully retired. The period of the equipment trust is usually from ten to fifteen years.

"The accounting procedure required by the Interstate Commerce Commission regarding acquisition and retirement of equipment is as follows:

"When equipment trust notes or other securities are issued to provide funds for the purchase of new equipment, the par value of these securities is added to the funded debt of the system. All equipment acquired is charged to investment account at cost. When any portion of the funded debt is discharged, naturally the liability account is reduced to that extent. As and when equipment is retired from service, the investment account is reduced by taking therefrom the value at which such equipment was carried in such account, and the resultant loss, less any salvage, is charged to operating expenses. From this it will be seen that, having discharged the liability incurred for the purchase of equipment, and having retired from service the equipment itself, the capital investment account and the capital liability account have both been purged of the amounts previously included in respect to such equipment, and the loss due to the wearing out of the equipment in service has been met by charges against operating account.

"That is the practice on our Canadian Lines. The practice on the Lines in the United States is similar except that the loss is taken care of by depreciation accruals as required by the Interstate Commerce Commission.

"A question regarding accounting procedure was raised at this Committee last year. Inquiry was then addressed to the Director of Accounting of the Interstate Commerce Commission as to the correct method of accounting for these certificates and reply was received indicating that the method adopted by us was in strict conformity with the requirements of the Commission."

Sir Henry Thornton, president of the road explained the practice of the Canadian National regarding investment in road and equipment. He said:

"I can only say that the practice of the Canadian National Railways with respect to mat-

ters of that sort is, in general, the accepted practice on most railways and is in accord with any legal obligations with which we may comply.

"As far as additions to capital are concerned I shall have to content myself with the statement that the railway is a constantly growing thing. There are constant annual necessitous expenditures on capital account, some of which are in themselves unremunerative but necessitous. For example, there is the Toronto viaduct proposition which involves a large expenditure of money but which will not reflect itself in our net earnings sufficiently, probably, to pay an interest on that investment. New passenger stations are necessitous in most cases, and generally unremunerative. When I say 'unremunerative' I mean looking at it purely from the point of view of what returns there are. There are constantly necessitous branch lines which must be built throughout the country, sometimes to open territory for prospective business, often to relieve a serious burden which rests upon our farming population but generally we endeavour—and when I say 'we' I mean the officers of the company, the directors and myself—to limit these capital expenditures to things which, having regard for all of the circumstances, we regard as necessitous, but there will be a constant steady increase in the capital of the railway just as there has been in the capital account of every railway."

CENTRAL INDIANA. — Modification of Abandonment Certificate Asked.—This company has applied to the Interstate Commerce Commission for a modification of the order of March 29, 1927, by which the commission authorized the abandonment of the entire line, so as to permit it to continue to operate the line between Anderson and Lebanon, Ind., to conclude, if possible, negotiations for sale to the Cleveland, Cincinnati, Chicago & St. Louis of lands and facilities at Muncie, Ind., and to abandon those portions of the line between Muncie and Anderson and between Lebanon and Brazil, Ind.

CENTRAL OF NEW JERSEY.—Annual Report.—The annual report for 1927 shows net income after interest and other charges of \$5,472,604 equivalent to \$19.94 per share earned on 274,368 shares of stock. Net income in 1926 was \$4,368,760, or \$15.92 per share. Selected items from the income statement follow:

| CENTRAL OF NEW JERSEY | | |
|--|--------------|--------------|
| | 1927 | 1926 |
| Average mileage operated | 690.99 | 690.89 |
| RAILWAY OPERATING REVENUES | \$58,745,712 | \$60,171,118 |
| Maintenance of way | 5,460,520 | 6,777,562 |
| Maintenance of equipment | 12,863,862 | 14,408,216 |
| Transportation | 22,725,529 | 22,517,903 |
| TOTAL OPERATING EXPENSES | 43,344,247 | 45,993,621 |
| Operating ratio | 73.78 | 76.44 |
| NET REVENUE FROM OPERATIONS | 15,401,465 | 14,177,497 |
| Railway tax accruals | 3,738,302 | 4,780,862 |
| Equipment rents, Dr. | 918,445 | 821,128 |
| Joint facility rents, Dr. | 347,095 | 446,162 |
| NET RAILWAY OPERATING INCOME | 10,383,653 | 8,051,535 |
| Non-operating income | 1,523,850 | 1,505,607 |
| GROSS INCOME | 2,376,835 | 2,343,873 |
| Rent for leased roads | 3,093,193 | 3,072,608 |
| Interest on funded debt | | |
| TOTAL DEDUCTIONS FROM GROSS INCOME | 6,595,856 | 6,022,392 |
| NET INCOME | 5,472,604 | 4,368,760 |

CHICAGO GREAT WESTERN.—Annual Report.—The annual report for 1927 shows net income after interest and other charges of \$400,398 equivalent to \$0.84 per share earned on 471,330 shares of 4%

preferred stock. Net income in 1926 was \$901,405, or \$1.91 per share. Selected items from the income statement follow:

| CHICAGO GREAT WESTERN | | |
|--|--------------|--------------|
| | 1927 | 1926 |
| Average mileage operated | 1,496.06 | 1,496.06 |
| RAILWAY OPERATING REVENUES | \$24,444,753 | \$25,359,000 |
| Maintenance of way | 3,374,710 | 3,422,674 |
| Maintenance of equipment | 4,639,132 | 4,991,567 |
| Transportation | 9,952,921 | 9,854,747 |
| TOTAL OPERATING EXPENSES | 19,722,210 | 20,027,496 |
| Operating ratio | 80.68 | 78.98 |
| NET REVENUE FROM OPERATIONS | 4,722,543 | 5,331,504 |
| Railway tax accruals | 1,042,859 | 1,129,183 |
| Railway operating income | 3,675,720 | 4,196,201 |
| Equipment rents, Dr. | 813,779 | 862,670 |
| Joint facility rents, Dr. | 899,495 | 866,385 |
| NET RAILWAY OPERATING INCOME | 1,962,446 | 2,467,147 |
| Non-operating income | 1,979,502 | 1,946,770 |
| GROSS INCOME | 5,655,223 | 6,142,971 |
| Rent for leased roads | 44,818 | 44,818 |
| Interest on funded debt | 1,706,221 | 1,698,304 |
| TOTAL DEDUCTIONS FROM GROSS INCOME | 5,254,825 | 5,241,567 |
| NET INCOME | 400,398 | 901,405 |

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—Bonds.—Kuhn, Loeb & Co. and the National City Company have purchased, subject to the approval of the Interstate Commerce Commission, \$24,000,000 Chicago, Milwaukee & St. Paul general mortgage 4½ per cent bonds, series E, due May 1, 1989, which they are offering at 102½ per cent and accrued interest to yield 4.38 per cent. The proceeds of the sale of the bonds are to be used to retire the \$14,000,000 10-year 6 per cent first mortgage bonds security, gold loan bonds of 1924, which are to be redeemed on July 1, 1928; to reimburse the company's treasury for the payment of the \$3,083,000 of Chicago & Missouri River Division bonds which matured July 1, 1926; for additions and betterments to the property and for other corporate purposes. The bonds will be issued under the general mortgage of the Chicago, Milwaukee & St. Paul and will be assumed by Chicago, Milwaukee, St. Paul & Pacific as successor. The general mortgage bonds, undisturbed in the reorganization of the Chicago, Milwaukee & St. Paul are an absolute first mortgage at approximately \$19,820 per mile on about 6,245 miles of road, including practically all the principal lines of the company between Chicago and the Missouri River. The bonds are not redeemable before July 1, 1938. They will be stamped to provide that they may be repurchased at the company's option, as a whole but not in part, on 60 days' previous notice on any interest date on or after July 1, 1938, at 107½ and accrued interest.

DELAWARE & HUDSON.—Acquisition.—The Interstate Commerce Commission has authorized the acquisition of control of the Ticonderoga by purchase of capital stock.

DULUTH, MISSABE & NORTHERN.—Annual Report.—The annual report for 1927 shows net income after interest and other

(Continued on page 1075)

Annual Report

Seventy-Fourth Annual Report of the Chicago, Burlington & Quincy Railroad Company

Chicago, January 3, 1928.

To the Stockholders of the Chicago, Burlington & Quincy Railroad Company:

The following is the report of your Board of Directors for the year ended December 31, 1927:

COMPARATIVE STATEMENT OF INCOME, YEARS ENDED DECEMBER 31

| Per cent of Ry. Oper. Revenue | 1927 | RAILWAY OPERATING REVENUES | 1926 | Per cent of Ry. Oper. Revenue |
|-------------------------------------|------------------|---|------------------|-------------------------------------|
| 75.80 | \$118,497,414.02 | Freight | \$121,410,650.40 | 75.26 |
| 14.11 | 22,058,572.19 | Passenger | 24,288,306.90 | 15.06 |
| 2.39 | 3,739,043.90 | Mail | 3,765,802.07 | 2.33 |
| 2.65 | 4,141,537.08 | Express | 4,292,310.49 | 2.66 |
| 2.87 | 4,488,783.87 | All other transportation | 4,577,554.54 | 2.84 |
| 1.60 | 2,494,883.06 | Incidental | 2,617,386.45 | 1.62 |
| .58 | 900,219.69 | Joint Facility | 365,431.34 | .23 |
| 100.00 | \$156,320,453.81 | Total railway operating revenues | \$161,317,442.19 | 100.00 |
| RAILWAY OPERATING EXPENSES | | | | |
| 15.14 | \$ 23,668,877.97 | Maintenance of way and structures | \$ 23,965,177.70 | 14.85 |
| 16.94 | 26,486,674.60 | Maintenance of equipment | 30,131,658.29 | 18.68 |
| 2.02 | 3,161,990.50 | Traffic | 3,084,633.02 | 1.91 |
| 34.23 | 53,503,271.98 | Transportation | 54,315,493.88 | 33.67 |
| 1.02 | 1,576,228.17 | Miscellaneous operations | 1,758,420.32 | 1.09 |
| 2.82 | 4,407,381.46 | General | 4,303,938.77 | 2.67 |
| Cr. .57 | Cr. 886,921.52 | Transportation for investment—Credit | Cr. 1,096,513.75 | Cr. .68 |
| 71.60 | \$111,917,503.16 | Total railway operating expenses | \$116,462,808.23 | 72.19 |
| 28.40 | \$ 44,402,950.65 | Net revenue from railway operations | \$ 44,854,633.96 | 27.81 |
| ..... | \$ 11,676,577.62 | Railway tax accruals | \$ 11,480,061.28 | ..... |
| ..... | 51,393.26 | Uncollectible railway revenues | 59,084.16 | ..... |
| ..... | \$ 32,674,979.77 | Railway operating income | \$ 33,315,488.52 | ..... |
| ..... | Dr. 2,364,201.33 | Hire of equipment—Net | Dr. 1,315,913.29 | ..... |
| ..... | Dr. 2,167,470.03 | Joint facility rents—Net | Dr. 2,043,744.53 | ..... |
| ..... | \$ 28,143,308.41 | Net railway operating income | \$ 29,955,830.70 | ..... |
| OTHER NON-OPERATING INCOME | | | | |
| ..... | \$ 612,571.29 | Miscellaneous rent income | \$ 610,872.27 | ..... |
| ..... | 2,212,047.10 | Dividends and miscellaneous interest | 2,306,574.37 | ..... |
| ..... | 57,288.84 | Miscellaneous income | 79,157.72 | ..... |
| ..... | \$ 2,881,907.23 | Total other non-operating income | \$ 2,996,604.36 | ..... |
| ..... | \$ 31,025,215.64 | Gross income | \$ 32,952,435.06 | ..... |
| OTHER DEDUCTIONS FROM GROSS INCOME | | | | |
| ..... | \$ 188,989.28 | Miscellaneous rents | \$ 191,358.38 | ..... |
| ..... | 9,126,458.33 | Interest on funded debt | 8,626,980.98 | ..... |
| ..... | 129,862.53 | Interest on unfunded debt | 34,583.31 | ..... |
| ..... | 135,531.72 | Amortization of discount on funded debt | 110,544.00 | ..... |
| ..... | 1,250.00 | Miscellaneous income charges | 1,000.00 | ..... |
| ..... | \$ 9,582,091.86 | Total other deductions from gross income | \$ 8,964,466.67 | ..... |
| ..... | \$ 21,443,123.78 | Net income | \$ 23,987,968.39 | ..... |
| DISPOSITION OF NET INCOME | | | | |
| ..... | ..... | Sinking funds | \$ 98,034.67 | ..... |
| ..... | \$ 17,083,815.00 | Dividends | 17,083,800.00 | ..... |
| ..... | \$ 17,083,815.00 | Total appropriations of income | \$ 17,181,834.67 | ..... |
| ..... | \$ 4,359,308.78 | Income balance transferred to profit and loss | \$ 6,806,133.72 | ..... |

GENERAL OPERATIONS

REVENUES:

| | |
|-----------------------------------|--------------------|
| Total Operating Revenues for 1927 | \$156,320,454 |
| Total Operating Revenues for 1926 | 161,317,442 |
| Decrease | \$ 4,996,988 3.10% |

The decrease was made up as follows:

| | | | |
|-------------------------------------|-----------|--------------|--------|
| Freight | Decreased | \$ 2,913,236 | 2.40% |
| Passenger | Decreased | 2,229,735 | 9.18% |
| Express | Decreased | 150,773 | 3.51% |
| Other Transportation Revenues | Decreased | 115,529 | 1.38% |
| Demurrage | Decreased | 67,168 | 17.96% |
| Other Incidental Operating Revenues | Increased | 479,453 | 18.38% |
| Total Decrease | | \$ 4,996,988 | |

The decrease of \$2,913,236, or 2.40%, in freight revenue was due to a decrease of 5.60% in the ton miles of revenue freight handled. With the exception of a heavier movement of agricultural products and somewhat lighter movement of animals and products, and coal, there was little change in the character of freight handled.

A comparison of tonnage with 1926 commodities shows the following:

| | | | |
|--------------------------------|-----------|----------------|--------|
| Products of Agriculture | Increased | 507,248 tons | 6.13% |
| Animals and Products | Decreased | 250,865 tons | 8.45% |
| Products of Mines | Decreased | 2,326,386 tons | 12.00% |
| Products of Forests | Increased | 11,762 tons | .47% |
| Manufactures and Miscellaneous | Increased | 270,433 tons | 2.92% |
| Less-than-carload tonnage | Increased | 36,029 tons | 2.28% |

Total tonnage Decreased 1,751,779 tons 3.99%

A comparison of carloads shows:

| | |
|--------------------------------------|----------------|
| Total cars (all commodities) in 1927 | 1,380,681 cars |
| Total cars (all commodities) in 1926 | 1,427,076 cars |

Decreased in 1927 46,395 cars 3.25%

Favorable crop conditions in western territory served by the Burlington resulted in an increase of 8,051 carloads of grain. The Nebraska wheat crop was a record for the state and the corn crop was the second largest. An increase of 11,568 cars loaded on our own rails west of the Missouri River reflected the favorable crop conditions in that territory. Since the change in the location of the fruit and vegetable market district in Chicago to a location adjacent to our team tracks there has been a steady increase in the movement of fruits and vegetables, there being an increase of 9,991 cars, or 17.51%, over the record of 57,059 cars handled during the preceding year. As a result of the heavy movement of grain, fruits and vegetables the tonnage of the total products of agriculture increased 6.13%.

Animals and products decreased 8.45%. The movement of live stock was the lightest in years. Crop failures and drouth in 1926 in western territory caused an exodus of practically all live stock that could be shipped, so that at the beginning of 1927 we had less live stock in our territory than for several years. This was not only true in the corn belt but range territory as well. With the exception of fresh meats and other packing house products and poultry, all other products coming under the classification of animals and products increased. Other items coming under this classification (including butter, cheese and eggs) exceeded the record movement of 1926.

The suspension of mining in coal fields east of the Missouri River, including Illinois, beginning April 1, 1927, and which continued until October 1, resulted in a decrease of 20.02% in our bituminous coal tonnage handled last year. The tonnage originating on the system decreased 28.88% and the tonnage received from connecting lines increased 21.76%. Rate reductions and the addition of new routes under which our hauls are less than formerly and the displacement of our own coal with coal of foreign origin, resulted in the average revenue per ton of all coal handled being reduced to \$1.68 as compared with \$1.70 the preceding year. With the exception of a substantial increase in the movement of sand, stone and gravel, other products of mines showed but little change.

Forest products increased 11,762 tons, or .47%, a decrease in the tonnage from the Northwest Coast states being offset by an increase in the movement from the south via the Paducah gateway.

The movement of manufactured articles increased 270,433 tons, or 2.92%, the tonnage of a number of important commodities coming under this classification exceeding all previous records.

Refined petroleum and its products, sugar including syrup and glucose, etc., also agricultural implements, increased 9.05%, 22.54% and 10%, respectively, over the previous record tonnage handled. Similar results were also shown for several less

[ADVERTISEMENT]

important commodities.

The decrease in passenger revenue was due almost entirely to hard road development and the increased use of automobiles. We carried 1,216,404 fewer revenue passengers than in 1926, a decrease of 7.43%; the decrease in passenger miles being 60,173,146 or 6.9%. The average haul per passenger, exclusive of commutation service, increased 7.3 miles over the preceding year, indicating that the decrease continues to be largely in the short haul traffic. The average revenue per passenger mile remained about the same—\$0.02718 in 1927 and \$0.02786 in 1926. The gross revenue from low-rate weekend excursions amounted to \$249,267, as against \$185,741 during 1926, an increase of \$63,526, or 34.20%, but we performed for this class of traffic in 1927 only 21,835 special train miles as against 22,125 in 1926, a decrease of 1.31%, and the average revenue per special train mile on this traffic in 1927 was \$5.46, as against \$3.89 in 1926, an increase of \$1.57 per train mile, or 40.36%. The earnings from Chicago District commutation traffic were approximately the same in 1927 as in 1926. The year 1927 was the third of the Burlington Escorted Tours Bureau, operated in conjunction with the Great Northern and Northern Pacific Railway Companies. In 1927 we handled a total of 3,439 passengers, an increase of 702 passengers, or 25.65% over 1926. The gross revenue to the three lines from this class of traffic in 1927 showed an increase of 22.7%.

OPERATING STATISTICS:

| | | |
|---|----------------|-------|
| Tons of revenue freight carried, 1927..... | 42,182,667 | |
| Tons of revenue freight carried, 1926..... | 43,934,446 | |
| Decrease | 1,751,779 | 3.99% |
| Revenue tons one mile, 1927..... | 11,942,859,045 | |
| Revenue tons one mile, 1926..... | 12,651,221,639 | |
| Decrease | 708,362,594 | 5.60% |
| Revenue tons per train mile, 1927..... | 665.64 | |
| Revenue tons per train mile, 1926..... | 679.96 | |
| Decrease | 14.32 | 2.11% |
| Revenue tons per loaded car, 1927..... | 22.46 | |
| Revenue tons per loaded car, 1926..... | 22.93 | |
| Decrease | .47 | 2.05% |
| Average revenue per ton mile (cents), 1927..... | .992 | |
| Average revenue per ton mile (cents), 1926..... | .960 | |
| Increase | .032 | 3.33% |
| Average distance hauled per revenue ton (miles), 1927 | 283.13 | |
| Average distance hauled per revenue ton (miles), 1926 | 287.96 | |
| Decrease | 4.83 | 1.68% |
| Revenue passengers carried, 1927..... | 15,149,391 | |
| Revenue passengers carried, 1926..... | 16,365,795 | |
| Decrease | 1,216,404 | 7.43% |
| Revenue passengers carried one mile, 1927..... | 811,600,215 | |
| Revenue passengers carried one mile, 1926..... | 871,773,361 | |
| Decrease | 60,173,146 | 6.90% |
| Average distance carried, revenue passengers, 1927 | 53.57 | |
| Average distance carried, revenue passengers, 1926 | 53.27 | |
| Increase | .30 | .56% |

EXPENDITURES (OPERATING)

| | |
|-------------------------------------|-----------------------|
| Total operating expenses, 1927..... | \$111,917,503.16 |
| Total operating expenses, 1926..... | 116,462,808.23 |
| Decrease | \$ 4,545,305.07 3.90% |

The decrease of \$4,545,305.07 in operating expenses was the result of various conditions having a direct influence on the three major classes of operating expenses, among the more important of which were the following:

In furtherance of our policy of maintaining our facilities in condition suitable for an improved handling of traffic, maintenance of way expenses were held at the same general level as that prevailing during the previous year, total expenses on this account decreasing \$269,300 or 1.24% under 1926. Relatively heavy expenditures were incurred in combating flood conditions in bottom lands in Illinois, in Iowa and to some extent in Missouri due to periods of continued and unusually heavy rain-fall during the summer months.

Transportation expenses were reduced \$812,222 or 1.50% under the comparatively low level prevailing in 1926. This was accomplished principally by a continued application of rigid measures of economy in all departments. An increase in efficiency, due in part to the improved appliances which it has been our policy to provide, also contributed to this reduction.

Maintenance of equipment expenses decreased \$3,644,984 or 12.10% under the preceding year. The programs for reconditioning equipment, to bring it to modern standards of efficiency, which have been carried on since the close of Federal control, are gradually reaching completion and materially reducing the necessity of expenditures on that account.

EXPENDITURES (CAPITAL):

There was expended during the year 1927, chargeable to Capital Account:

| | |
|---------------------|-----------------|
| For Road | \$ 5,842,571.90 |
| For Equipment | 3,196,411.45 |
| For General | 1,932,898.56 |
| Total | \$10,971,881.91 |

INDUSTRIAL:

During the year we executed 431 new industrial leases, a substantial increase over last year, indicating a continued expansion of industrial development throughout our territory. New industrial tracks were constructed as follows:

| | New Tracks | Extensions |
|---|------------|------------|
| On Lines East of the Missouri River.... | 24 | 24 |
| On Lines West of the Missouri River.... | 11 | 5 |
| | 35 | 29 |

In Chicago, 27 new industries were located on our rails, furnishing us an estimated annual traffic revenue, approximately, of one-half million dollars.

AGRICULTURAL:

The year 1927 was an exceptionally good agricultural year for Lines West, but rather unfavorable for Lines East on account of the poor corn crop. Nebraska produced one of the largest crops of both wheat and corn in the history of the state, resulting in heavy grain shipments on Lines West. A record acreage of sugar beets was harvested; the Wyoming crop established a new record for acreage and tonnage. Shipments of potatoes and beans were heavy. The poultry and dairy industries were expanded. A cattle shortage has developed and prices have rapidly advanced. Cattle feeding operations were curtailed on Lines East, but the number of hogs on farms was increased. Prices for grain and live stock with the exception of hogs were very satisfactory to producers and the agricultural outlook is very much brighter than a year ago. This improvement has been reflected in an increased demand for farms.

Four agricultural special trains designed to stimulate agricultural development, increase traffic and improve agricultural conditions were operated during the year. A sugar beet demonstration train of seven cars showing how to increase yield per acre was exhibited just prior to planting time to 31,449 people at 37 towns in the Great Western Sugar Company beet growing districts. Harvest figures showed that the 1927 crop of beets averaged 1.8 tons more per acre than the average for the previous ten years. The increased yield which amounted to 542,640 tons on the 310,492 acres harvested, and which added more than four million dollars to the farmers' gross income, was in a large measure due to better methods of growing inaugurated by this educational campaign. The average yield per acre of beets during the past three years during which educational trains have been operated is 2.3 tons higher than the average of the previous ten-year period.

A large amount of publicity was given to improved agricultural practices and many agricultural meetings and farm tours were attended. A special train of 70 cars of wheat was operated from Perkins County, Nebraska, to the Omaha market for publicity purposes and to advertise the resources of the county. Farm boys' and girls' club work was given encouragement by scholarship awards in five states. Folders were printed and distributed to extend the production of rice along the Mississippi River; to increase the use of limestone and the acreage of legumes; to eliminate wheat smut; and to introduce better methods of handling poultry. A 28-page illustrated folder about the North Platte Valley was printed and 40,000 copies distributed in cooperation with the Associated Chambers of Commerce. Special attention was given to attracting settlers to the North Platte and the Shoshone government irrigation projects in cooperation with the U. S. Reclamation Service. All of the 122 farm units on the North Platte Project were taken and 37 new settlers were located on the Shoshone Project. 1,645 entries were made on 737,419 acres of vacant government homestead land in Wyoming tributary to Burlington lines. This compares with 1,414 entries in 1926. 417 carloads of emigrants' effects were unloaded on the Alliance, Casper, McCook, Sheridan and Sterling divisions as compared to 620 in 1926; shipments by truck are to some extent responsible for the decrease. 3,184 inquiries for farm land were received in response to classified advertising; and a large volume of descriptive literature was distributed.

The Directors express their appreciation of the co-operation and the faithful and efficient services rendered by the officers and employees of the Company during the year.

HALE HOLDEN,
President.

By order of the Board of Directors.

Financial News

(Continued from page 1072)

charges of \$6,345,518 as compared with net income in 1926 of \$7,805,029. Selected items from the income statement follow:

| DULUTH, MISSABE & NORTHERN | | |
|--|--------------|--------------|
| | 1927 | 1926 |
| RAILWAY OPERATING REVENUES | \$15,835,484 | \$18,943,968 |
| Maintenance of way | 2,022,237 | 2,108,032 |
| Maintenance of equipment | 2,378,820 | 2,401,470 |
| Transportation | 3,103,603 | 3,497,549 |
| TOTAL OPERATING EXPENSES | 7,858,242 | 8,403,940 |
| Operating ratio | 49.62 | 44.36 |
| NET REVENUE FROM OPERATIONS | 7,977,242 | 10,540,928 |
| Railway tax accruals | 1,904,710 | 2,474,438 |
| Railway operating income | 6,072,486 | 8,056,468 |
| Equipment rents and joint facility rents, Net Dr. | 54,989 | 50,695 |
| NET RAILWAY OPERATING INCOME | 6,017,496 | 8,015,773 |
| Non-operating income | 907,448 | 849,102 |
| GROSS INCOME | 6,924,945 | 8,858,159 |
| Rent for leased roads | 207,021 | 205,563 |
| Interest on funded debt | 341,288 | 366,931 |
| TOTAL DEDUCTIONS FROM GROSS INCOME | 579,427 | 1,053,129 |
| NET INCOME | 6,345,518 | 7,805,029 |
| Disposition of net income | | |
| Sinking and other reserve funds, Cr. | 274,604 | 126,030 |
| Balance of net income for the year | 6,620,122 | 7,678,999 |

ELGIN, JOLIET & EASTERN.—Annual Report.—The annual report for 1927 shows net income after interest and other charges of \$1,545,241 as compared with net income of 1926 of \$2,060,574. Selected items from the income statement follow:

| ELGIN, JOLIET & EASTERN | | |
|---|--------------|--------------|
| | 1927 | 1926 |
| Average mileage operated | 460.78 | 459.98 |
| RAILWAY OPERATING REVENUES | \$24,281,541 | \$26,432,112 |
| Maintenance of way | 2,493,011 | 2,391,539 |
| Maintenance of equipment | 5,138,647 | 5,432,469 |
| Transportation | 8,579,921 | 8,671,933 |
| TOTAL OPERATING EXPENSES | 17,000,308 | 17,275,369 |
| Operating ratio | 70.01 | 65.36 |
| Railway tax accruals | 1,379,826 | 1,429,750 |
| Railway operating income | 5,900,859 | 7,726,300 |
| NET RAILWAY OPERATING INCOME | 4,178,780 | 5,657,361 |
| Non-operating income | 424,292 | 365,716 |
| GROSS INCOME | 4,603,072 | 6,023,077 |
| Rent for leased roads | 2,356,060 | 3,257,925 |
| Interest on funded debt | 500,000 | 500,000 |
| TOTAL DEDUCTIONS FROM GROSS INCOME | 3,057,831 | 3,962,503 |
| NET INCOME | 1,545,241 | 2,060,574 |

GRAND TRUNK JUNCTION.—Discharge of Bonds.—Discharge of a first mortgage on the Grand Trunk Junction in Chicago was explained last week at Ottawa, Canada, before the special House Committee of the Canadian Parliament on National Railways and Shipping by R. A. C. Henry, of the Canadian National as follows:

"It represents a first mortgage upon what is known as the Grand Trunk Junction Railway,

which extends from 49th Street to Elsdon Street, Chicago. The purpose of retiring these bonds is to permit the discharge of the mortgage on certain properties sold years ago to the Santa Fe, and in connection with which the Canadian National Railways will receive \$1,300,000. That discharge cannot be given until these bonds are paid off, so the purpose of discharging this mortgage is to permit that transaction to be completed. The total of the items just mentioned is \$53,740,179. As against that, there are certain resources excluding the eastern lines. These resources are estimated at \$41,814,919, and they represent the estimated difference between the revenues and expenses for the coming year. Of those resources, \$6,192,000 represents the estimated resources of the eastern lines."

GREAT NORTHERN.—Six Months Guaranty.—Arguments were heard by the Supreme Court of the United States on April 30 in the case in which this company is contesting the right of the Interstate Commerce Commission to issue a corrected certificate for the amount of the guaranty for the six-months period following the termination of federal control in 1920. After the company had received \$12,500,000 on certificates for advance and partial payments the commission issued a corrected certificate that the company had been overpaid by \$1,329,785.

KANSAS OKLAHOMA & GULF.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue and sell \$3,951,000 of first mortgage 5 per cent gold bonds, and the Kansas, Oklahoma & Gulf of Texas has asked authority for an issue of \$67,800 of first mortgage 30-year bonds, to be purchased by the K. O. & G.

LOUISVILLE, HENDERSON & ST. LOUIS.—Lease.—Directors of this railroad have instructed R. N. Hudson, president, to execute a lease with the Louisville & Nashville whereby the latter will take over the operation of the property of the Louisville, Henderson & St. Louis for a period of 99 years. The road has a mileage of nearly 200 miles. The main line runs from Louisville to Henderson, where connections with the L. & N. are made for St. Louis. The L. H. & St. L., organized 40 years ago, has property valued at \$18,000,000. The capital stock of the company is \$4,000,000. The action of the directors will become effective when ratified by the stockholders at a meeting in Louisville on June 7, and when approval for the execution of the lease is given by the Interstate Commerce Commission.

LONG ISLAND.—Annual Report.—The annual report for 1927 shows net income after interest and other charges of \$3,273,272 equivalent to \$4.79 per share earned on capital stock. Net income in 1926 was \$3,144,171, or \$4.61 per share. Selected items from the income statement follow:

| LONG ISLAND | | |
|--|--------------|--------------|
| | 1927 | 1926 |
| Average mileage operated | 403.95 | 401.45 |
| RAILWAY OPERATING REVENUE | \$40,886,581 | \$39,648,538 |
| Maintenance of way | 5,510,801 | 5,045,573 |
| Maintenance of equipment | 6,271,392 | 6,360,022 |
| Transportation | 16,807,793 | 16,159,406 |
| TOTAL OPERATING EXPENSES | 30,111,966 | 29,007,593 |
| Operating ratio | 73.6 | 73.2 |
| NET REVENUE FROM OPERATIONS | 10,774,615 | 10,640,946 |

| | | |
|--|-----------|-----------|
| Railway tax accruals | 2,472,139 | 2,151,527 |
| Railway operating income | 8,256,197 | 8,481,272 |
| Equipment rents, Dr. Bal. | 822,541 | 1,356,309 |
| Joint facility rents, Dr. Bal. | 1,271,077 | 1,292,733 |
| NET RAILWAY OPERATING INCOME | 6,162,578 | 5,832,230 |
| Non-operating income | 773,232 | 790,783 |
| GROSS INCOME | 6,935,810 | 6,623,013 |
| Rent for leased roads | 60,001 | 60,001 |
| Interest on funded debt | 3,177,961 | 3,055,359 |
| TOTAL DEDUCTIONS FROM GROSS INCOME | 3,662,539 | 3,478,842 |
| NET INCOME | 3,273,272 | 3,144,171 |
| Disposition of net income | | |
| Sinking and other reserve funds | 752 | 538 |
| Dividend appropriation of income, 4 per cent | 1,364,410 | |
| Balance carried to profit and loss | 1,908,110 | 3,143,633 |

MINNEAPOLIS & ST. LOUIS.—Final Valuation.—The Interstate Commerce Commission has issued its final valuation report finding the final value for rate-making purposes of the property owned and used for common-carrier purposes as of 1917 to be \$45,403,000; that of the property owned but not used, \$1,010,833 and that used but not owned, \$84,458. The company's books record an investment of \$68,418,760 on valuation date, but the report says that readjustments indicated by the accounting examination would reduce this to \$58,553,951.

MISSOURI PACIFIC.—Acquisition.—The Interstate Commerce Commission has made public a proposed report by Examiner Thomas F. Sullivan recommending that the commission deny this company's application for authority to construct a line from a connection with the tracks of the Southern Illinois & Missouri Bridge Company at Illmo, Mo., to a connection with the tracks and right of way formerly owned by the Cape Girardeau Northern, approximately 3.3 miles, and to acquire and reconstruct the line of the Cape Girardeau Northern from the terminus of the line to be constructed to a point west of Cape Girardeau, approximately 6.7 miles. The ultimate result, he said, apparently would be a division of traffic between the applicant and the St. Louis-San Francisco in a general territory where available traffic is light and the prospects of development are not bright.

NEW ORLEANS, TEXAS & MEXICO.—Annual Report.—The annual report for 1927 shows net income after interest and other charges of \$475,723 equivalent to \$3.17 per share earned on 150,000 shares of stock. Net income in 1926 was \$1,874,560, or \$12.49 per share. Selected items from the income statement follow:

| NEW ORLEANS, TEXAS & MEXICO | | |
|---|--------------|--------------|
| | 1927 | 1926 |
| Average mileage operated | 992.83 | 926.06 |
| RAILWAY OPERATING REVENUES | \$15,428,651 | \$16,500,683 |
| Maintenance of way | 3,195,139 | 3,077,210 |
| Maintenance of equipment | 2,782,675 | 2,802,053 |
| Transportation | 4,977,381 | 4,595,885 |

| | | |
|--|------------|------------|
| TOTAL OPERATING EXPENSES | 12,084,940 | 11,580,539 |
| Operating ratio | 78.33 | 70.18 |
| NET REVENUE FROM OPERATIONS | 3,343,711 | 4,920,143 |
| Railway tax accruals | 744,088 | 765,752 |
| Railway operating income | 2,590,192 | 4,149,420 |
| Hire of freight cars, Dr. | 434,434 | 466,273 |
| Joint facility rents, Dr. | 242,841 | 257,828 |
| NET RAILWAY OPERATING INCOME | 1,910,674 | 3,415,735 |
| Non-operating income | 717,528 | 333,005 |
| GROSS INCOME | 2,628,202 | 3,748,740 |
| Rent for leased roads | 34,000 | |
| Interest on funded debt | 2,050,239 | 1,862,238 |
| TOTAL DEDUCTIONS FROM GROSS INCOME | 2,152,479 | 1,874,180 |
| NET INCOME | 475,723 | 1,874,560 |

ST. LOUIS-SAN FRANCISCO.—Equipment Trust Certificates.—This company has applied to the Interstate Commerce Commission for authority to issue \$6,000,000 4 per cent equipment trust certificates, to be sold to a group of bankers consisting of Blair & Co.; E. H. Rollins & Sons; Blyth, Witter & Co.; and Janney & Co., at 98.011 and accrued dividends, the highest bid received.

ST. LOUIS-SOUTHWESTERN.—Annual Report.—The annual report for 1927 shows net income after interest and other charges of \$1,847,814 as compared with net income in 1926 of \$2,405,540. Selected items from the income statement follow:

| | 1927 | 1926 |
|--|--------------|--------------|
| Average mileage operated | 1,747.81 | 1,747.78 |
| RAILWAY OPERATING REVENUES | \$24,206,525 | \$25,692,826 |
| Maintenance of way | 4,641,477 | 4,864,847 |
| Maintenance of equipment | 3,938,912 | 4,660,630 |
| Transportation | 7,442,189 | 7,491,604 |
| TOTAL OPERATING EXPENSES | 18,494,571 | 19,353,457 |
| Operating ratio | 76.40 | 75.33 |
| NET REVENUE FROM OPERATIONS | 5,711,954 | 6,339,369 |
| Railway tax accruals | 1,184,943 | 1,289,631 |
| Railway operating income | 4,521,766 | 5,043,926 |
| Hire of freight cars, Dr. | 9,989 | Cr. 142,024 |
| Joint facility rents, Dr. | 335,485 | 309,739 |
| NET RAILWAY OPERATING INCOME | 4,164,372 | 4,891,778 |
| Non-operating income | 555,750 | 211,990 |
| GROSS INCOME | 4,720,122 | 5,103,768 |
| Interest on funded debt | 2,631,502 | 2,655,515 |
| TOTAL DEDUCTIONS FROM GROSS INCOME | 2,872,308 | 2,698,229 |
| NET INCOME | 1,847,814 | 2,405,540 |
| Disposition of net income | | |
| Income applied to sinking funds | 33,171 | 58,625 |
| Inc. appropriated for Invest. in Physical Property | | 1,336 |
| Income balance carried to profit and loss | 1,814,643 | 2,345,579 |

TEXAS & PACIFIC.—Equipment Trust Certificates.—This company has applied to the Interstate Commerce Commission for authority for an issue of \$1,515,000 of 4 per cent equipment trust certificates, to be sold to the Bankers Trust Company and Evans, Stillman & Co., the highest bidders, at 97.7617 and interest.

UNION RAILROAD OF OREGON.—Authorized to Operate Railroad.—The Interstate Commerce Commission has authorized this company to acquire and operate a line from Union Jct. to Union, Ore., 2.1 miles. This line is or was owned by the Central Railroad of Oregon, together with some additional mileage. Operation was discontinued in December, 1926, when an I. C. C. locomotive inspector ordered its only locomotive out of service. In February, 1927, rail of the line was sold for unpaid taxes. Rails were removed from all portions of line except between Union Jct. and Union. The applicant is incorporated for \$25,000 and proposes to use proceeds from sale of this stock for the purchase of this line, clearing title and for equipment. The line is now being operated by two of the incorporators. Counsel for the receiver of the Central intervened, contending among other things that it would be improper to issue a certificate while applicant's title is being contested in the courts. The I. C. C. granted the certificate stating that it did so without passing on questions of right and title to the property in question.

WESTERN MARYLAND.—Control of Chesapeake & Curtis Bay.—The Interstate Commerce Commission has affirmed its original finding, authorizing the Western Maryland to acquire control of the Chesapeake, by purchase of capital stock, under condition that the latter company continue to be operated as at present until further authority is granted. The road is at present operated jointly by the Western Maryland and the Pennsylvania. Commissioner Lewis dissented and was joined therein by Commissioners Campbell and Eastman.

YANKTON, NORFOLK & SOUTHERN.—Charter Granted.—The state of South Dakota granted a charter on April 20 for this railroad, which it is planned to construct between Yankton, S. D., and Norfolk, Neb., a distance of about 66 miles. The cost of construction is estimated at \$1,250,000. The following have been elected officers of the company: T. J. Frick, Yankton, president; Charles Ruden, Crofton, Neb., vice-president; E. A. Bruce, Yankton, secretary; August Danielson, Wausa, Neb., treasurer; Harold A. Doyle, Yankton, attorney.

Average Prices of Stocks and of Bonds

| | May 1 | Last week | Last year |
|--|--------|-----------|-----------|
| Average price of 20 representative railway stocks .. | 125.71 | 121.87 | 109.31 |
| Average price of 20 representative railway bonds .. | 96.15 | 96.40 | 94.28 |

Dividends Declared

Delaware & Hudson.—\$2.25, quarterly, payable June 20 to holders of record May 28.
 New York, Chicago & St. Louis.—Common, 1½ per cent, quarterly; preferred, 1½ per cent, quarterly, both payable July 2 to holders of record May 15.
 New Orleans, Texas & Mexico.—\$1.75, quarterly, payable June 1 to holders of record May 15.
 Pennsylvania Railroad.—\$0.87½, quarterly, payable May 31 to holders of record May 1.
 Reading Company.—First preferred, 1 per cent, quarterly, payable June 14 to holders of record May 24.

Officers

Executive

D. N. Kirby, vice-president of the Manufacturers Railway, with headquarters at St. Louis, Mo., has also been elected vice-president of the St. Louis & O'Fallon.

William H. Williams, chairman of the board and of the executive committee of the Missouri Pacific, has been elected chairman of the board of the Denver & Rio Grande Western. **T. M. Schumacher**, former chairman, has been elected chairman of the executive committee. Until his election as chairman of the board, Mr. Williams was chairman of the executive committee.

William Cotter, who resigned as president and general manager of the St. Louis & O'Fallon and the Manufacturers Railway because of ill health and on April 3 was elected president, retired, and his services retained as consultant, has completed 54 years of continuous railway service. He was born at Bloomington, Ill., in 1858 and entered railway service at the age of 16 years as a telegraph operator on the Chicago & Alton. Four years later Mr. Cotter became an operator on the St. Louis, Iron Mountain & Southern (now a part of the Missouri Pacific) at Piedmont, Mo., and from 1878 to 1896 he served successively as dispatcher and trainmaster on the Iron Mountain at Little Rock, Ark., as dispatcher on the Chicago, Milwaukee & St. Paul at La Crosse, Wis., as dispatcher on the Wabash, St. Louis & Pacific and its successor, the Wabash, at Litchfield, Ill., and as trainmaster of the St. Louis di-



William Cotter

vision of the Wabash. He was then appointed superintendent of the Eastern division of the Grand Trunk, with headquarters at Montreal, Que., being transferred to the Western division, with headquarters at Detroit, Mich., in 1899, where he remained until July 1, 1901, when he was appointed general super-

intendent of the Iron Mountain at St. Louis, Mo. In October of the following year Mr. Cotter was promoted to manager of the Missouri Pacific system, with headquarters at St. Louis, and in October, 1904, he was appointed general manager of the Pere Marquette, with headquarters at Detroit, Mich., also acting as president, during the receivership of the railroad, from December 14, 1907, to April 5, 1912, and as president and general manager of the Cincinnati, Hamilton & Dayton (now a part of the Baltimore & Ohio) from 1907 to 1911. He was elected president and general manager of the St. Louis & O'Fallon and the Manufacturers, with headquarters at St. Louis, in 1916. Mr. Cotter also acted as receiver for the Chicago, Peoria & St. Louis (now the Chicago, Springfield & St. Louis and the Jacksonville & Havana) from August 1, 1914, until its operation was discontinued in 1926.

Operating

A. S. Twombly, assistant division superintendent on the Boston & Maine, has been appointed superintendent of the Portland division, with headquarters at Boston, Mass., succeeding **A. P. Milliken**, assigned to other duties.

Philip E. Pfeifer, assistant to the general manager of the Boston & Maine, with headquarters at Boston, Mass., has been appointed assistant general manager in charge of train operation, with headquarters at the same point.

G. S. Lytle, assistant superintendent in the Saskatchewan district of the Canadian Pacific, with headquarters at Wilkie, Sask., has been appointed transportation assistant in the Manitoba district, with headquarters at Winnipeg, Man., succeeding **W. B. Harris**, who has been granted a leave of absence.

Howard L. H. Blair, assistant to the general manager of the Central region of the Pennsylvania, with headquarters at Pittsburgh, Pa., since 1901, has retired under the pension rules of the company after more than 47 years of service in the operating department of that road.

James J. Kinsella, superintendent of car service of the Chicago Junction and the Chicago River & Indiana, has been promoted to assistant superintendent, succeeding **John J. Kinsella** who retired from active service on May 1. **M. F. Barry**, chief yard clerk, has been promoted to superintendent of car service to replace James J. Kinsella. **J. N. Bolin**, assistant to the trainmaster, has been promoted to night trainmaster. All will have headquarters at Union Stock Yards, Chicago.

Walter T. Moodie, superintendent of the Rainy River division of the Canadian National, with headquarters at Port Arthur, Ont., has been promoted to general superintendent of the Northern Ontario district, with headquarters at North Bay, Ont., succeeding **W. R. Devenish** who has been transferred to the Alberta district, with headquarters at Edmonton, Alta. Mr. Devenish re-

places **W. A. Brown** who retired from active service on May 1. **N. P. North**, superintendent of the Hornepayne division, with headquarters at Hornepayne, Ont., has been transferred to the Rainy River division to succeed Mr. Moodie and **J. E. Nelson**, superintendent of the Edmonton division, with headquarters at Edmonton, Alta., has been transferred to succeed Mr. North. **R. King**, superintendent of the Calgary division, with headquarters at Calgary, Alta., has been transferred to the Dauphin division, with headquarters at Dauphin, Man., to succeed **J. P. Johnson**, who has been transferred to the Calgary division. **J. L. Cameron**, assistant superintendent at Edmonton, has been promoted to superintendent of the Edmonton division.

William A. Brown, general superintendent of the Alberta district of the Canadian National, with headquarters at Edmonton, Alta., retired from active service at his own request on May 1 after 50 years of railway service, more than 26 of which had been spent with the Canadian National. Mr. Brown was born on March 6, 1862, at St. John, N. B., and entered railway service in June, 1878, as a fireman on the St. John & Maine (now part of the Canadian Pacific). From 1879 to 1901 he served as brakeman on the St. John & Maine, as brakeman on the Canadian Pacific at St. Boniface, Man., and Winnipeg, as freight conductor at Brandon, Man., and Winnipeg, and as passenger conductor, trainmaster and acting superintendent at Ft. William, Ont. Mr. Brown was then promoted to superintendent at Moose Jaw, Sask., and in 1902 he became superintendent of the Canadian Northern (now part of the Canadian National) at Winnipeg. In 1903 he was transferred to Port Arthur, Ont., and two years later he was promoted to general superintendent, with headquarters at Winnipeg, becoming superintendent of the Canadian Northern at Edmonton in 1908. Mr. Brown was appointed general superintendent of the Western division of the Canadian Northern, which is now the Alberta district of Canadian National, in 1912.

Engineering, Maintenance of Way and Signaling

E. H. Piper, division engineer on construction of the Ft. Worth & Denver South Plains, has been appointed engineer of maintenance of way of the Wyoming division of the Chicago, Burlington & Quincy, with headquarters at Alliance, Nev., effective May 1.

H. E. Smith, assistant engineer in the office of the district engineer of the Montreal district of the Canadian National at Montreal, Que., has been promoted to division engineer of the Portland, division.

Robert Faries, who has been appointed assistant chief engineer of maintenance of the Pennsylvania, with headquarters at Philadelphia, Pa., was born on November 30, 1881, at Bellwood, Pa.

He entered railroad service on May 5, 1899, as a rodman on the Pennsylvania. From August 1, 1905, to May 1, 1916 he served successively as supervisor at Jamesburg, N. J., Trenton, N. J. and Washington, D. C., and from June 1, 1917, to February 1, 1918 as division en-



Robert Faries

gineer successively at Elmira, N. Y., Williamsport, Pa., and Pittsburgh, Pa. On November 1, 1924, Mr. Faries was appointed superintendent at Buffalo, N. Y., serving in this capacity until his recent appointment as assistant chief engineer of maintenance.

H. M. Righter, division engineer on the New York district of the Erie, with headquarters at Jersey City, N. J., has been promoted to engineer of maintenance of way of the Western district, with headquarters at Youngstown, Ohio, succeeding **H. Knight**. **F. S. Wheeler**, division engineer on the Eastern district, with headquarters at Salamanca, N. Y., has been transferred to Jersey City to succeed Mr. Righter. **J. G. June**, superintendent of the Marion division, with headquarters at Huntington, Ind., has been appointed division engineer at Salamanca to succeed Mr. Wheeler.

F. Clinkscales has been appointed traveling engineer on the Southern Pacific (Texas and Louisiana lines), succeeding **C. R. Haberman**, who has been assigned to other duties.

Traffic

John M. Ball, who has been promoted to assistant freight traffic manager of the Gulf Coast Lines and the International-Great Northern with headquarters at Houston, Tex., entered railway service in 1893 as an office boy on the Ft. Worth & Rio Grande at Ft. Worth, Tex. Later he was advanced successively to stenographer and rate clerk and then became soliciting freight agent on the St. Louis Southwestern at Ft. Worth. After being transferred to Houston Mr. Ball entered the service of the International-Great Northern as soliciting agent at Houston on September 1, 1902. His subsequent service with the International-Great Northern included the positions of commercial agent at